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ABSTRACT

This document contains papers presented at a conference addressing the direction for the institutional research profession in the 1990s. Papers are as follows: "Reassessing Admission Policies at Public Universities: Cognitive vs. Non-Cognitive Predictors of 'Academic Success'" (Marios H. Agrotes); "Accommodating Team Member Cognitive Styles" (Brenda L. Bailey); "Anticipated Academic and Personal Concerns of Students Prior to Transferring to a Four-Year Institution: An Initial Report" (Paul F. Bauer, Karen W. Bauer); "Evaluating Institutional Efforts to Compensate Faculty" (Scott Bodfish); "Student Intention and Retention in a Community College Setting" (Glynis Daniels); "Patterns and Predictors of Persistence in Undergraduate Majors" (Anne Marie Delaney); "Financing Undergraduate Education: Variations in Sources and Levels of Debt among Student Segments" (Anne Marie Delaney); "Assessing an Alumni Reunion Program" (Rose Bacmanski, Mark A. Eckstein); "Recruitment in the 1990's: An Empirical Investigation on the Impact of 'Message' on the Enrollment Decision Process" (David J. Costello, Kathleen Dawley); "Public Versus Private Education: The Perception of Value and the College-Choice Decision" (David J. Costello, Suzanne Szydlik, Linda Phelan); "Who are the Adult Learners in College Today and What Can We Do To Make Their Stay More Palatable?" (Denise M. Hart); "Identifying the Career Planning Needs of Community College Students: Undecided vs. Indecisive Students" (Kathleen Keenan); "A Comparison of Exit and Retrospective Surveys" (Margaret E. Madden, David Weir); "Developing Measures of Academic and Administrative Productivity During a Time of Budget Recision" (Michael F. Middaugh, Herbert M. Turner III); "The Role of Institutional Research in Developing a Campus Affirmative Action Plan," and "The Nature and Scope of Institutional Research: The Changing Face of the IR Profession" (Michael F. Middaugh); "Cultivating the Loyalty of Young Alumni to Their Alma Mater: The Success of the Cornell Tradition Program" (Yuko Mulugetta and others); "The Top of the Funnel: An Initial Analysis of an Inquiry Population" (Marian F. Pagano, Dawn Geronimo Terkla); "The Use of Structured Interviews in a Qualitative Study of Admissions Publications" (Jane Anderson Price); "A Framework for Systematic Budget Analysis" (Linda A. Suskie); "Forecasting Enrollment in a Period of Institutional Transition" (Stephen W. Thorpe); "Creating a Sense of Need for an Institutional Research Office" (David R. Weir, Jr., Margaret E. Madden, James R. Swanson, Sr.); "Why So Few Science Graduates? An Investigation of Enrollments in Undergraduate Science Programs" (Jennifer Wilton); "Advantages of Inter-Institutional Cooperation" (Carol L. Wurster); and "Experiences Associated with the Growth and Satisfaction Reported by Graduating Seniors" (J. Fredericks Volkwein, Debra D. Woods). (GLR)

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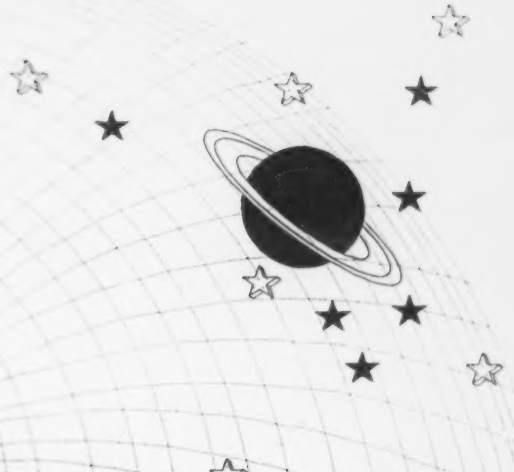
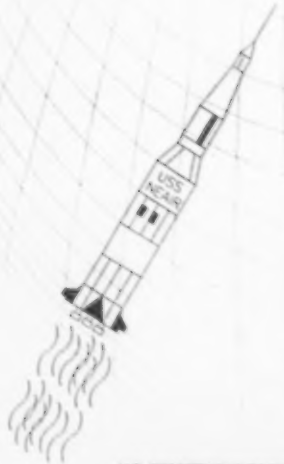


North East Association for Institutional Research

17th Annual Conference

# Institutional Research: Its Place in the 1990's

PROCEEDINGS



The Albany Hilton
Albany, New York

October 21 - 23, 1990

U.S. DEPARTMENT OF EDUCATION
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## PRESIDENT'S MESSAGE

It is my distinct pleasure to present to you the Proceedings from the 17th Annual Conference of the North East Association for Institutional Research, held in Albany, New York on October 21-23, 1990. The theme of the Conference was "Institutional Research: Its Place in the 1990's". The papers and workshops did, indeed, address a refocusing of direction for the institutional research profession as we move ahead in the last decade of the 20th Century. The Keynote Address by D. Bruce Johnstone, Chancellor of the State University of New York, recommended ways in which institutional research can help colleges and universities explore innovative ways of attracting, retaining, and graduating students during a decade of fiscal austerity. Particularly helpful were the papers and panels presented by both new and veteran members of NEAIR which centered upon the continually evolving role that institutional research fills within an institution, and how NEAIR can provide support to its members during a period of rapid change in the profession. The discussions were provocative, the ideas new and refreshing. I left the Conference with a heightened sense of optimism and enthusiasm both for my profession and for NEAIR.

Special thanks go to two individuals who labored long and hard to make this Conference a success. Dawn Terkla, 1990 Program Chair, assembled one of the most cohesive and thoroughly interesting programs I've seen in my 12 years in NEAIR. Indeed, one member complained to me that he could usually find a gap in conference programs where nothing interested him and he could have some free time; not so this year, the Program was simply too rich to leave. Wendell Lorang worked countless hours making certain that the Albany Hilton would be a most hospitable home to us for three days. The Sunday entertainment with "Rude Girls" and Monday's Murder Mystery Buffet were two innovative special events that made this Conference especially memorable.

Thanks to Albert Lefebvre, 1990 Publications Chair, for his yeoman work in bringing these Proceedings to you. Best wishes to Lee DeLucia, Betty Johnson, and Alan Sturtz as they exit the Steering Committee; thanks for your hard work over the past two years. Special thanks to Linda Suskie, whose term as Treasurer expires in June. This is one of the most difficult jobs in the Association, and Linda handled it in exemplary fashion. And best wishes and affectionate farewell to Jennifer Presley, who leaves NEAIR to assume new challenges in the Midwest.

Congratulations to Larry Metzger on his election to the position of President-Elect. Larry brings a rich base of experience to the position, and he will guide us well during his tenure. I am grateful to the Steering Committee for their confidence in my leadership in asking me to continue as your President during the transition period leading to Larry Metzger's term in office. This is a very special professional association,

one for which I hold a great deal of affection. It's my pleasure to be a part of NEAIR and to serve in any way I can.

Thanks to everyone for making 1989-90, and particularly the 17th Annual Conference, a total success.

Mike Middaugh, University of Delaware
NEAIR President, 1989-90

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# NEAIR 1990 CONFERENCE PROGRAM

## SUNDAY, October 21

**8:00 am - 5:00 pm** — **REGISTRATION - Pre-function Area**

**9:00 am - 12:00 pm**
**Workshop**
**Van Rensselaer**

**Newcomers to Institutional Research**

Michael F. Middaugh, Director, Institutional Research and Planning, University of Delaware

This workshop is designed to give new practitioners in institutional research a hands-on approach to getting started in the field. Using *The NEAIR Monograph for Newcomers to Institutional Research*, workshop participants will walk through a series of exercises designed to address such issues as: How to ensure data integrity; developing factbooks and reports that are read and used by college presidents; defining critical issues for institutional research at your college or university; identifying sources of data; conducting survey research; using personal computers and commercial software in institutional research and strategic planning; developing forecasting models. The workshop will also address the political pitfalls in institutional research, and will discuss how the new practitioner can effectively link his/her office with the strategic planning/decision making center at their institution.

**9:00 am - 12:00 pm**
**Workshop**
**Ten Broeck**

**Principles of Financial Management and Analysis for Institutional Researchers**

James P. Honan, Assistant to the President for Research and Planning, Lesley College

This workshop is designed for individuals with little or no knowledge of nonprofit financial management and accounting terms, concepts, and analytic techniques. It will provide institutional research professionals with a broad understanding of the development and use of financial information in colleges and universities. Among the topics which will be discussed are fund accounting, chart of accounts, basis of accounting, preparation and interpretation of financial statements, ratio analysis, and budgeting formats.

Selected readings, a specific case study on financial management and analysis in higher education, and a glossary of terms in nonprofit financial management will be utilized. The workshop will not attempt to produce accountants or budget officers. It is intended to improve management and analytic skills by making participants better consumers of financial data.

# NEAIR 1990 CONFERENCE PROGRAM

**SUNDAY, October 21**

**9:00 am - 5:00 pm**
Workshop
Beverwyck

**Institutional Planning: Principles and Applications**

John A. Dunn, Jr., Executive Director, Center for Planning Information, Tufts University

Institutional researchers are often called on to support or manage planning processes. Textbooks don't help; they assume institutional differences do not exist. This workshop focuses on underlying principles and their application to specific situations described by the attendees. The workshop will be highly participatory; though it is designed for people who already have some planning experience, newcomers will also be welcome. Participants will receive a variety of selected papers on planning, including pre-publication copies of the *SCUP Guide for New Planners* and Schmidtlein & Milton's *NDIR* volume on planning processes used at several institutions (forthcoming).

**12:00 pm - 1:30 pm**
Arthur's Court

**PRESIDENT'S LUNCH** *(Steering Committee, Conference Workers, and Workshop Presenters)*

**1:30 pm - 5:00 pm**
Workshop
Van Rensselaer

**Introductory Statistics for Institutional Research**

Marian Pagano, Researcher/Analyst, Institutional Research, Tufts University

This workshop will cover a variety of descriptive statistical techniques and three inferential techniques - chi-square, t-test, and analysis of variance. The workshop will serve as a robust introduction or refresher course for participants, using data from a recent IR project to demonstrate and illustrate the techniques.

It is assumed that participants will be using statistical software packages to do their actual number crunching, therefore computation will be de-emphasized in the workshop, while theory, appropriate application and convention will be emphasized.

**3:00 pm - 3:30 pm**

**COFFEE BREAK**

**1:30 pm - 5:00 pm**
Workshop
Ten Broeck

**Survey Research: What Works for the Institutional Researcher**

Linda A. Suskie, Assistant to the President for Planning, Millersville University of Pennsylvania

Planning and conducting an effective questionnaire survey. Includes discussions and small group work on clarifying objectives, sample size, the issue of anonymity, item types, general principles for writing items, assessing reliability and validity, and conducting the survey. Participants will receive copies of NEAIR's monograph on survey research.

**6:00 pm/7:00 pm/8:30 pm**

**SOCIAL HOUR/DINNER/DANCING - Underwritten by IBM**

# NEAIR 1990 CONFERENCE PROGRAM

## MONDAY, October 22

| | |
|---|---|
| 8:00 am - 12:00 pm | **REGISTRATION - Pre-function Area** |
| 7:45 am - 9:00 am | **CONTINENTAL BREAKFAST - Underwritten by Sun Microsystems** |
| 8:00 am - 9:00 am | **Two-year Colleges** |
| Special Interest Group<br>Schuyler | Alan J. Sturtz, Director, Institutional Research, Planning and Development, South Central Community College<br>This SIG is intended for individuals dealing with or concerned with the IR function in two-year institutions. Problems, concerns and issues (e.g., federal disclosure reporting forms) will be discussed in an informal setting. |
| 8:00 am - 9:00 am | **Higher Education Data Sharing Consortium (HEDS)** |
| Special Interest Group<br>Ten Broeck | Jennifer Mauldin, Director, HEDS Consortium, Tufts University<br>An opportunity for members of the HEDS Consortium and others interested in data exchange activities to discuss current plans, with a focus on studies of institutional productivity and of institutional effectiveness. |
| 8:00 am - 9:00 am | **The Public Universities Information Exchange (*The Exchange*)** |
| Special Interest Group<br>Beverwyck | John A. Dunn, Jr., Executive Director, Center for Planning Information, Tufts University<br>A new venture, *The Exchange* is being created to help major public institutions collect, analyze and share information that is useful in research, planning and management. The SIG is an opportunity for early members and others who are interested to discuss current plans, which include comparative faculty workload studies and overall staffing patterns. |
| 8:00 am - 9:00 am | **SUNY Association of Institutional Research and Planning Officers** |
| Special Interest Group<br>Van Rensselaer | Carl Bacon, President, Association of Institutional Research and Planning Officers and Director, Institutional Research, State University of New York at New Paltz |
| 9:00 am - 10:15 am | **GENERAL SESSION** |
| Ballrooms A & B | Keynote Address: "Determining a Positive Future During Difficult Times," D. Bruce Johnstone, Chancellor of the State University of New York |
| 10:15 am - 10:30 am | **COFFEE BREAK - Underwritten by Zenith Data Systems** |

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

10:30 am - 11:15 am
Contributed Paper
Schuyler

**Traipsing into Tricky Territory: Assessment of Student Personal Development, Involvement and Satisfaction Outcomes**

Angela C. Suchanic, Coordinator, Institutional Studies, Trenton State College
Moderator: Ellen A. Kanarek

Assessment of student personal development, involvement and satisfaction is gaining increased attention as the general assessment movement gains momentum. This paper describes the ways in which this territory can be approached by institutional research. Provided will be specific information on literature sources, organizational issues and assessment methodologies.

10:30 am - 11:15 am
Contributed Paper
Ten Broeck

**The Impact of Hispanic Family Involvement on College Persistence**

Henry Ross, Director, Institutional Research, Kean College of New Jersey
Jose Sanchez, Senior Research Associate, Institutional Research, Kean College of New Jersey
Moderator: Bayard Baylis

Hispanic students look to family support in both their decision to drop out or to stay in college and succeed. The ethic of familism, a component of most Hispanic cultures, can thus be a tool for increasing retention rates for these students. Use of focus groups or other strategies will be discussed.

10:30 am - 11:15 am
Contributed Paper
Beverwyck

**The Use of Structured Interviews in a Qualitative Study of Admissions Publications**

Jane Price, Assistant Director, Institutional Research, Franklin & Marshall College
Moderator: Barbara Rudy

As the number of traditional college-aged students declines and the competition among colleges for students increases, an institution's Admissions recruitment literature becomes increasingly important. Institutional Research personnel are more frequently being called upon to evaluate the success of their institution's Admissions publications. The present study offers a framework for such an evaluation, using individual, in-depth interviews with high school and college students. It shares qualitative and quantitative data on students' preferences for different styles and strategies that are currently used in Admissions literature.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

10:30 am - 11:15 am
Contributed Paper
Van Rensselaer

**The Role of Institutional Research in Developing a Campus Affirmative Action Plan**

Michael F. Middaugh, Director, Institutional Research and Planning, University of Delaware
Moderator: James R. Swanson

The Office of Institutional Research and Planning at the University of Delaware plays a central role in the development of the Campus Affirmative Action Plan. The process whereby the University's workforce analysis is developed, personnel utilization patterns are analyzed and compared with hiring availability data, and hiring goals are established will be fully described. As important as the data are the processes through which they are verified and internalized by constituencies across campus are critical. Strategies for involving the entire campus in developing accurate affirmative action information will be described.

10:30 am - 12:00 pm
Panel
Ballroom C

**Darwinism and the Higher Education Organization**

Larry W. Metzger, Director, Institutional Research, Ithaca College
Jennifer B. Presley, Executive Director, Policy Research and Planning, University of Massachusetts, Boston
Robert F. Grose, Director, Institutional Research (Emeritus), Amherst College
Richard C. Heck, Director, Budget, Institutional Planning and Research, Colgate University

Perspectives on the evolution of Institutional Research, the profession and its organizations (NEAIR), with retrospectives, current diagnosis, and forecasts for the 90's. Where are we going from here? Who will survive? In what form? Recommended reading: *Organizing Effective IR Offices*, **New Directions in Institutional Research,** No. 66, August 1990.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

11:20 am - 12:00 pm
Contributed Paper
Schuyler

**Undergraduate Experiences Associated with the Growth and Satisfaction Reported By Graduating Seniors**

J. Fredericks Volkwein, Director, Institutional Research, State University of New York at Albany
Debra Woods, Graduate Student, State University of New York at Albany
Moderator: Audrey Adam

This investigation attempts to improve upon the measures of academic and social integration and the measures of student growth which were developed at Albany by Patrick Terenzini during the late 1970's. Analyzing the responses from a quadrennial survey of graduating seniors, the presentation focuses on the relationships among student performance, student growth, and various undergraduate experiences, especially student effort and allocation of time.

11:20 am - 12:00 pm
Workshare
Ten Broeck

**Freshman and Follow-up Surveys**

Albert C. Lefebvre, Director, Institutional Studies, Clark University
Indira Govindan, Research Analyst, Institutional Studies, Clark University

Preliminary analysis of how views of new freshmen change after two years at a private liberal arts college. Data about degree plans, careers, and social issues from two consecutive C.I.R.P. Freshman and Follow-Up Surveys will be presented. Suggestions for using and reporting other results from these surveys at similar institutions will also be discussed.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

11:20 am - 12:00 pm
Contributed Paper
Beverwyck

**Financing Undergraduate Education: Variations in Sources and Levels of Debt Among Student Segments**

Anne Marie Delaney, Director, Enrollment Management Research Office, Boston College
Moderator: Lou Fabian

The primary purpose of this paper is to document and discuss the implications of how a recent graduating class at a private New England university financed their undergraduate education. The paper will address the following questions: To what extent did students rely on loans, scholarships and grants, and family resources in acquiring their college degree? How much debt did they incur? What are the perceived effects of the level of indebtedness on graduates' future plans? How do major sources of financing and perceived effects of level of indebtedness vary among different student segments?

11:20 am - 12:00 pm
Contributed Paper
Van Rensselaer

**Identifying the Career Planning Needs of Community College Students: Undecided vs Indecisive Students**

Kathleen Keenan, Director, Institutional Research, Massasoit Community College
Moderator: Darryl Bullock

This study, of community college students, collected data on present stages of career planning and intentions to use college services from 2,000 entering students. Two groups of students in need of services were identified: undecided, those who seek information to develop specific goals; and indecisive, those who admit to difficulty in decision making, and are less likely to use services.

12:00 pm - 1:30 pm

LUNCH/BUSINESS MEETING

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

1:30 pm - 2:15 pm
Contributed Paper
Schuyler

**Why So Few Science Graduates? An Investigation of Enrollments in Undergraduate Science Programs Between Admission and Degree Completion.**

Jennifer Wilton, Associate Director, Data Management, Policy Research and Planning, University of Massachusetts at Boston
Moderator: Richard C. Heck

An investigation of science program enrollments at one institution from admission through completion, with an emphasis on uncovering the points at which students leave the sciences, and the causes of this exodus.

1:30 pm - 2:15 pm
Contributed Paper
Ten Broeck

**Institutional Responsibility to Students: A Faculty Workload Model**

James P. Honan, Assistant to the President for Research and Planning, Lesley College
Carol Moore, Dean of Undergraduate School, Lesley College
Moderator: Thomas M. Freeman

This paper will describe a faculty workload model which has recently been developed at Lesley College and will provide an overview of the process through which the model was developed.

1:30 pm - 3:00 pm
Workshare
Beverwyck

**Applications of SPSS Software in Institutional Research**

Mary Ann Coughlin, Statistician/Programmer, Smith College

This workshare will present an overview of basic applications of SPSS software to a variety of functions performed in an Institutional Research office by presenting both specific examples of uses of SPSS and providing an overview of the broad range of applications met by SPSS within this setting. Participants are encouraged to discuss and share their specific or potential applications of SPSS software to current projects or needs.

1:30 pm - 3:00 pm
Demonstration
Van Rensselaer

**Evolution of a Comprehensive University Information System**

Thomas A. Egan, Director, Management Information Systems, West Chester University
Greg Nyce, MIS, West Chester University
R. Criss Mattison, MIS, West Chester University
Geraldine K. Bellam, MIS, West Chester University

At West Chester University an information system was developed to enable users of official University data to become self-sufficient in obtaining information. The system which provides menu-driven access to approximately fifty reports in each of the previous fifty academic sessions, contains information that previously had been accessible only via printed documents.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

1:30 pm - 3:00 pm
Panel
Ballroom C

**Students and AIDS**

Jennifer Brown, Director, Institutional Research, Connecticut State University
Barbara Sosnowitz, Professor of Sociology/Social Work, Central Connecticut State University
Susan Maskel, Department of Biology and Environmental Science, Western Connecticut State University
Angela Vincenzi, Department of Nursing, Southern Connecticut State University

Concern about students and acquired immunodeficiency syndrome (AIDS) has been growing at campuses all over the country. This panel will include an overview of existing literature and reports of three ongoing campus research projects which use different methodologies to examine some key issues in AIDS education and prevention.

2:20 pm - 3:00 pm
Contributed Paper
Schuyler

**Public vs Private Education: The Perception of Value and the College-Choice Decision**

David Costello, Vice President, Information Systems and Research, Maguire Associates, Inc.
Suzanne Szylik, Research Analyst, Maguire Associates, Inc.
Linda Phelan, Research Analyst, Maguire Associates, Inc.
Moderator: Thomas E. Gusler

The perception of value as it relates to education is critical to understand in these days of budget cutting and program evaluations. For many students, this perception is best understood as they contemplate the decision to enroll in either a public or private institution. How "value" intertwines with students' perceptions of costs and quality is investigated in this paper. Moreover, the perception of value is understood as it relates to the likelihood of students applying and enrolling within a particular institution.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

**2:20 pm - 3:00 pm**
**Contributed Paper**
**Ten Broeck**

**Projecting the Number of New Freshmen Enrollees: A Logistic Regression Application**

Bruce Szelest, Associate, Institutional Research, State University of New York at Albany
Moderator: Marian Steinberg

This presentation reviews the development and application of a logit regression model to predict the number of accepted freshmen who will enroll. The logit regression technique provides insights into the influences of high success indicators and demographic characteristics upon enrollment behavior.

**3:00 pm - 3:30 pm**

**COFFEE BREAK - Underwritten by WANG Laboratories**

**3:30 pm - 4:15 pm**
**Contributed Paper**
**Schuyler**

**Forecasting Enrollment in a Period of Institutional Transition**

Stephen W. Thorpe, Director, Institutional Research and Planning, Wesley College
Moderator: Marsha V. Krotseng

This paper describes an enrollment forecast model that was developed for a small, private, liberal arts college undergoing an institutional transition from its historical junior college mission to becoming a comprehensive baccalaureate institution. The model, which has projected enrollment within one percent of actual for the past two years, is guiding the college administration in budgeting and strategic planning for the 1990's.

**3:30 pm - 4:15 pm**
**Contributed Paper**
**Ten Broeck**

**Who are the Adult Learners in College Today and What Can We Do To Make Their Stay More Palatable?**

Denise Hart, Director, Adult Education, Fairleigh Dickinson University
Moderator: Robert Karp

During the 1989-90 year Fairleigh Dickinson University's University Advisory Committee on Adult Learners surveyed a random population of adult learners, 25 years of age and older, on the three New Jersey campuses. The intention was to provide a profile of the increasing adult learner cohort with information about their needs, the support services requested and utilized and directions for future planning.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

3:30 pm - 4:15 pm
Contributed Paper
Beverwyck

**Patterns and Predictors of Persistence in Undergraduate Majors**

Anne Marie Delaney, Director, Enrollment Management Research, Boston College
Moderator: Stuart L. Rich

The primary objective of this paper is to present the methodology and results of a study designed to identify patterns and predictors of student persistence and net enrollment changes in undergraduate major fields of study. The paper will provide an overview of persistence rates for all entrance majors. Focusing on specific academic majors, the paper will present the results of research addressing the following questions: When do students change their entrance major? What alternative majors do students choose? How do persisters and non-persisters in specific major fields differ in terms of selected admissions criteria and undergraduate academic performance?

3:30 pm - 4:15 pm
Contributed Paper
Van Rensselaer

**Accommodating Team Member Cognitive Styles**

Brenda L. Bailey, Coordinator, Institutional Research, Edinboro University of Pennsylvania
Moderator: Jean Vinsonhaler

A new information-based society is emerging with an emphasis on teams, participation, and decentralization. As a result, institutional researchers need various people skills. This paper explores the use of Kolb's experiential learning theory to develop successful teams. A model of the cognitive styles of higher education administration is included.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

**A New Agenda for NEAIR**

3:30 pm - 5:00 pm
Panel
Ballroom C

Marian Pagano, Researcher/Analyst, Institutional Research, Tufts University
Sara Crawley, Affirmative Action Consultant, Harvard University
Kimberley Dolphin, Assistant Director, HEDS/CPI, Tufts University
James Honan, Assistant to the President for Research and Planning, Lesley College
Michael McGuire, Senior Planning Officer, Franklin & Marshall College
Robert Yanckello, Assistant Director, Central Connecticut State University

A group of newer members discuss their views on issues that will face NEAIR as it moves into the 90's and defines itself as a profession. The Panel will discuss issues of diversity, sexism, racism, empowerment, and Institutional Research's relationship with other campus offices.

4:20 pm - 5:00 pm
Contributed Paper
Schuyler

**Anticipated Academic and Personal Concerns of College Students Prior to Transferring to a Four-year Institution: An Initial Report**

Paul F. Bauer, Professor, Philosophy, Cecil Community College
Karen W. Bauer, Research Analyst, Institutional Research and Planning, University of Delaware
Moderator: Jean V. Kipler

A survey was developed and administered to approximately 130 community college students who planned to transfer to a four-year institution. Students indicated their anticipated academic and personal concerns prior to transferring. Students will be re-surveyed next year to determine which concerns were actually experienced. Benefits to academic advising and recruiting will be discussed.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

4:20 pm - 5:00 pm
Contributed Paper
Ten Broeck

**A Comparison of Exit and Retrospective Surveys**

Margaret E. Madden, Assistant to Vice President and Dean of the College, Franklin Pierce College
David Weir, Associate Director, Admissions, Franklin Pierce College
Moderator: Maree Glanville

Responses to two kinds of exit surveys, interviews at the time of withdrawal and telephone surveys about two years later with a cohort of students at a small rural liberal arts college, are compared. Respondents emphasized different reasons for leaving in the two studies. Policy implications of these response tendencies will be discussed.

4:20 pm - 5:00 pm
Contributed Paper
Beverwyck

**Undergraduate Experiences Associated with the Career Success and Satisfaction of Alumni**

J. Fredericks Volkwein, Director, Institutional Research, State University of New York at Albany
Fuqin Bian, Graduate Student, State University of New York at Albany
Moderator: Richard L. Kline

Using a population of 2,000 Albany Alumni, this study examines the relationship between their career success and their prior undergraduate endeavors. The presentation will show the scales which have been developed to measure various career characteristics and college experiences.

# NEAIR 1990 CONFERENCE PROGRAM

MONDAY, October 22

4:20 pm - 5:00 pm
Contributed Paper
Van Rensselaer

**Developing Measures of Academic and Administrative Productivity During a Time of Budget Recision**

Michael F. Middaugh, Director, Institutional Research and Planning, University of Delaware
Herbert M. Turner, Institutional Research Analyst, University of Delaware
Moderator: John P. Jacobsen

This paper discusses concept and strategy for developing appropriate measures of productivity to support resource reallocation decisions during a period of budget recision. Drawing heavily from Massy's (1989) discussion of the need for baseline productivity measures, the paper describes how such measures were developed at a large research university, how they were presented to campus managers, and how they were used in budget decisions.

6:00 pm
Ballroom A

**MURDER MYSTERY BUFFET DINNER - Special Event**
Murder by Design, an evening buffet punctuated by politics and mayhem. $35.00 per person, special registration and ticket required. See registration form.

# NEAIR 1990 CONFERENCE PROGRAM

**TUESDAY, October 23**

**7:45 am - 9:00 am** — **CONTINENTAL BREAKFAST**

**Attendance at Breakfast Roundtables is on a first come first served basis, limited to 15 attendees**

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**Executive Information System: A Simple Start**

Albert C. Lefebvre, Director, Institutional Studies, Clark University

At certain times during an academic year, higher education executives crave daily doses of certain data. This roundtable will describe a method of providing critical information to decision makers in a timely fashion.

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**How to Manage the PC in the IR Office**

Richard C. Heck, Director, Budget, Institutional Planning and Research, Colgate University

What can we learn from one another about how to manage the PC in the IR office? How does one select software? How does the staff get trained? Who trouble-shoots? How does one get productivity boost we all seek? What are the traps and pit-falls to guard against? What has worked well for you? Come prepared to share your office set-up, your problems, solutions, and strategies for managing.

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**Perils of Accreditation Preparation**

Marian N. Steinberg, Director, Planning and Institutional Research, Eastern Connecticut State University

Colleagues who have gone through accreditation are invited to join with those currently preparing for or anticipating an accreditation visit. The moderator, whose institution will have been visited prior to the conference, will discuss the problems with dealing with the plethora of committees to assure that data is available, properly analyzed, understood and integrated. We welcome the opportunity to talk about the kinds of information that is useful, experiences with the accrediting team, and hints on how to survive accreditation while strengthening the institution's on-going decision support capabilities.

# NEAIR 1990 CONFERENCE PROGRAM

**TUESDAY, October 23**

**Attendance at Breakfast Roundtables is on a first come first served basis, limited to 15 attendees**

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**The Institutional Research Role in Outcomes Assessment at a Community College**

Bonnie L. Strunk, Institutional Research and Grant Administration Officer, Lehigh County Community College

Because externally mandated initiatives are making institutions more accountable for the quality of education provided, Institutional Research offices in the 1990's will be busy giving colleges a clearer image of themselves and their performance. Assessment activities take a variety of forms, and rotatable discussion will focus on outcomes currently being assessed and methods being used on various campuses.

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**What's New for the ASQ?**

Ellen Kanarek, Program Director, Applied Educational Research, Inc.

Participants will hear a brief presentation on developments in the College Board's Admitted Student Questionnaire. They will then be asked to share their own experiences with the ASQ such as timing of its administration, response rates, presentation of data, and actions taken as a result of the study.

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**Issues in the Assessment of Prior Learning**

Denise Hart, Director, Adult Education, Fairleigh Dickinson University

With the increasing number of adult learners returning to the college classroom, the assessment of a variety of options to obtain college credit is at issue. How are institutions of higher education addressing this situation? What standards can be established? What guidelines presently exist at each of the institutions for prior learning assessment? Is there a standard practice nationally? And what obligations do we as educators have for future planning in this area? This is a participatory session.

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**Conference Evaluation (Invited Interview)**

Michael McGuire, Senior Planning Officer, Franklin & Marshall College

**7:45 am - 9:00 am**
**Breakfast Roundtable**
**Ballroom E**

**Conference Evaluation (Invited Interview)**

Susan Forti, Special Projects Manager, Boston University

# NEAIR 1990 CONFERENCE PROGRAM

TUESDAY, October 23

9:00 am - 9:40 am
Contributed Paper
Schuyler

**The Top of the Funnel: An Initial Analysis of an Inquiry Population**

Marian Pagano, Researcher/Analyst, Institutional Research, Tufts University
Dawn Geronimo Terkla, Director, Institutional Research, Tufts University
Moderator: Ronald P. Maggiore

This paper will present the methodology and preliminary results of a study designed to determine what factors influence a students decision NOT to apply to a school after an initial inquiry has been made.

9:00 am - 9:40 am
Contributed Paper
Ten Broeck

**Student Intention and Retention in a Community College Setting**

Glynis Daniels, Research Analyst, Brookdale Community College
Moderator: Hugh J. McFadden, Jr.

Is there really a problem with community college retention? Or are low retention rates the result of a diverse student body with non-traditional goals? This study follows students with a variety of stated educational goals through two years of college enrollment and examines the assumption that all college students are in search of a degree.

9:00 am - 9:40 am
Contributed Paper
Beverwyck

**Using Focus Groups to Strengthen Institutional Research and Planning**

Robert C. Froh, Associate Director, Evaluation and Research, Syracuse University
Peter Gray, Director, Evaluation and Research, Syracuse University
Ruth Fedderman, Intern, Evaluation and Research, Syracuse University
Moderator: James L. Ritchie

This session will help institutional researchers reap the benefits of a more extensive use of the focus group method. This session will discuss the strengths of focus groups in explicating higher education issues.

# NEAIR 1990 CONFERENCE PROGRAM

**TUESDAY, October 23**

**9:00 am - 9:40 am**
**Contributed Paper**
**Van Rensselaer**

**Creating a Sense of Need for an Institutional Research Office**

David Weir, Associate Director, Admissions, Franklin Pierce College
Margaret E. Madden, Assistant to Vice President and Dean of the College, Franklin Pierce College
James Swanson, Program Manager, New Hampshire College and University Council
Moderator: Kimberley Dolphin

Timely and innovative research studies can provide the springboard for the establishment of an Institutional Research office. How spontaneous studies can be used to create a sense of need for formal institutional research will be discussed.

**9:00 am - 10:25 am**
**Panel**
**Ballroom C**

**Who Owns the Data?**

Robert F. Grose, Professor of Psychology, Amherst College
William Lauroesch, Associate Professor, University of Massachusetts, Amherst
Sandra J. Price, Director, Institutional Research, Keene State College
Lois E. Torrence, Director, Institutional Research, University of Connecticut
Moderator: Michael C. Schiltz

Data in colleges are collected, shared, analyzed, ignored, used, made public, hidden, stored, and discarded. Yet the "ownership" and control of data and of information are often not clear. e.g. Who decides which data may be released? Who should? The Panel will explore such questions; audience contributions will be solicited.

**9:45 am - 10:25 am**
**Contributed Paper**
**Schuyler**

**Cognitive vs Noncognitive Predictors of Academic Success**

Marios H. Agrotes, Research Associate, Institutional Research, State University of New York at Albany
Moderator: Angela C. Suchanic

This paper examines the issue of cognitive vs noncognitive predictors of academic success, with emphasis on Sedlacek's work and his set of noncognitive measures which he claims do a better job of predicting academic success for black students than traditional admissions measures. Using Albany student survey and tracking data we attempted to replicate his research, with interesting results.

# NEAIR 1990 CONFERENCE PROGRAM

**TUESDAY, October 23**

**9:45 am - 10:25 am**
**Contributed Paper**
**Ten Broeck**

**Merging Academic Departments: The Impact on Organizational Effectiveness and Culture**

Min-Chin Chiang, Associate Professor of Public Administration, National Chung Hsing University, Taiwan
Ronald B. Hoskins, Executive Assistant to the President for Planning and Research, Professor of Public Administration, State University of New York at Albany
Moderator: Richard Rugen

This paper presents the results of a national study of the effects of academic department mergers on organizational effectiveness and culture. Based on a survey of faculty representing more than 70 university departments involved in mergers during the 1980's in nine states, the paper describes the environmental conditions and perceived causes that lead to mergers and the result of the two most common acculturation models (i.e., integration and separation) observed in organizational mergers.

**9:45 am - 10:25 am**
**Contributed Paper**
**Beverwyck**

**A Framework For Systematic Budget Analysis**

Linda A. Suskie, Assistant to the President for Planning, Millersville University of Pennsylvania
Moderator: Brother Paul Scheiter

In order to evaluate institutional budgets and identify inappropriately high or low expenditures, it is posited that managers must have one or more frames of reference as bases for comparison. Four frames of reference are proposed: change, norm-referenced, criterion-referenced, and qualitative. Examples of analyses within each frame of reference are provided.

# NEAIR 1990 CONFERENCE PROGRAM

**TUESDAY, October 23**

**9:45 am - 10:25 am**
**Contributed Paper**
**Van Rensselaer**

**The Nature and Scope of Institutional Research: The Changing Face of the IR Profession**

Michael F. Middaugh, Director, Institutional Research and Planning, University of Delaware
Moderator: Larry Metzger

Drawing upon the literature in organization theory, an open system framework is established for looking at and understanding colleges and universities as dynamic enterprises interacting with both internal and external environments. The concept of natural selection is extended to suggest that only those institutions with effective adaptive strategies for coping with internal and external environmental pressures will be successful. Institutional research must also adapt to those pressures, and in so doing, will likely undergo significant changes in what constitutes the institutional research agenda, analytical strategies, and reporting techniques.

**10:25 am - 10:40 am** COFFEE BREAK

**10:40 am - 11:20 am**
**Contributed Paper**
**Schuyler**

**Recruitment in the 1990's: An Empirical Investigation on the Impact of 'Message' on the Enrollment Decision Process**

David J. Costello, Vice President, Information Systems and Research, Maguire Associates, Inc.
Kathleen Dawley, Vice President of Strategic Communications, Maguire Associates, Inc.
Moderator: Michael D. McGuire

The messages that an institution sends to the educational marketplace have a varying impact on the student enrollment decision process. It has been assumed that by understanding the prospective students' transition from the inquiry to applicant stage an institution can better position itself in an increasingly competitive market. Results from a telephone survey of 483 inquiry students suggest that the concept of cognitive dissonance plays a critical role in how students come to view specific aspects of an institution.

# NEAIR 1990 CONFERENCE PROGRAM

TUESDAY, October 23

10:40 am - 11:20 am
Workshare
Ten Broeck

**A Microcomputer-Based Reference Catalog: Locating Information in the Institutional Research Office**

Richard W. Prull, Acting Director, Institutional Research and Planning, Rhode Island College

Over time Institutional Research offices can accumulate a great amount of information, sometimes making it difficult to locate material on a particular topic. To help organize and locate information a microcomputer-based reference catalog using dBase was developed. This workshare will describe this system, give examples of its use, and provide an opportunity for discussion about what others might be doing in this area.

10:40 am - 11:20 am
Contributed Paper
Beverwyck

**Effect of Athletic Participation on Undergraduate Education**

Anne Marie Delaney, Director, Enrollment Management Research Office; Boston College
Moderator: Geraldine K. Bellam

The primary objective of this paper is to discuss the results of research examining the effect of participation in varsity athletics on student retention and academic performance. The paper presents a comparative retention and academic performance profile of Non-Athletes, Athletes in Revenue Sports, and Athletes in Non-Revenue Sports at a private New England university. The effects of athletic participation on retention and academic performance are examined independently and controlling for selected admissions characteristics. The significance of these effects is discussed within the context of the role of sports in American Higher Education.

10:40 am - 11:20 am
Contributed Paper
Van Rensselaer

**Advantages of Inter-Institutional Cooperation**

Carol L. Wurster, Associate for Institutional Research, State University of New York at Old Westbury
Marjorie K. Raab, Associate Dean of Instruction, Nassau Community College
Moderator: Karen L. Futoma

Cooperation and data-sharing between 2-year and 4-year institutions have not been the norm. Our on-going project provides invaluable information for both. From the 4-year perspective, previously unavailable data on transfers provide information for recruitment, articulation, program planning and enrollment management. From the 2-year perspective information allows for pre- and post-transfer status of former students.

# NEAIR 1990 CONFERENCE PROGRAM

**TUESDAY, October 23**

**10:40 am - 11:20 am**
**Demonstration**
**Ballroom C**

**Using SPSSx for Data Management**

Dale Trusheim, Associate Director, Institutional Research and Planning, University of Delaware

This demonstration involves utilizing SPSSx for data management and reporting purposes. It assumes basic understanding and familiarity with SPSSx (Version 3.0). The demonstration covers file management (e.g. system files match, and add files), as well as procedures for organizing and reporting data (e.g., autorecode, aggregate, report, and tables).

**11:25 am - 12:05 pm**
**Contributed Paper**
**Schuyler**

**Cultivating Young Alumni's Loyalty to their Alma Mater: The Success of the Cornell Tradition Program**

Yuko Mulugetta, Research Associate, Financial Aid Office, Cornell University
Susan H. Murphy, Dean, Admissions and Financial Aid, Cornell University
Donald Saleh, Director, Financial Aid and Student Employment, Cornell University
Ann Brewster, Research Assistant, Cornell Tradition Program, Cornell University
Moderator: Dale Trusheim

Using multiple regression, the study has found that the Cornell Tradition Fellowship Program is successful in cultivating more active donors through the implementation of the reduction of undergraduate loans.

**11:25 am - 12:05 pm**
**Contributed Paper**
**Ten Broeck**

**Assessing an Alumni Reunion Weekend Program**

Rose Bacmanski, Assistant Director, Alumni and Parent Relations, State University of New York at Binghamton
Mark A. Eckstein, Director, Assessment and Institutional Research, Genesee Community College
Moderator: Thomas Egan

Alumni reunions are the cornerstone of alumni programs. However, not all universities achieve the level of participation desired. The interests and concerns of alumni were assessed via a questionnaire, and the results are being used to alter the Reunion Weekend program in hopes of increasing participation.

# NEAIR 1990 CONFERENCE PROGRAM

**TUESDAY, October 23**

**11:25 am - 12:05 pm**
**Contributed Paper**
**Beverwyck**

**Expectation vs Achievement: Are Students Getting What They Want from College?**

Alan J. Sturtz, Director, Institutional Research, Planning and Development, South Central Community College
Moderator: R. Criss Mattison

Every year a survey is administered to all new students. This study examines, over a period of five years, what percentage of new students indicate their intention to receive a degree from South Central, how many who say they intend to receive a higher degree actually transfer, what are the most often listed goals new students want to achieve, and have these changed over the course of the study.

**11:25 am - 12:05 pm**
**Contributed Paper**
**Van Rensselaer**

**Evaluating Institutional Efforts to Compensate Faculty**

Scott Bodfish, Director, Institutional Research and Planning Support, Wilkes University
Moderator: Richard W. Prull

This paper presents a model to account for the correlation between average faculty salaries, and tuition levels, using multiple regression analysis of institutional data on private colleges and universities. Different regression analyses are discussed, and their applications to different research issues will be noted.

**11:25 am - 12:05 pm**
**Demonstration**
**Ballroom C**

**Efficient Use of PC's for Statistical Analysis**

Hans Ladanyi, Director, Institutional and Small Business Research, University of Maine at Presque Isle

This is a demonstration of the efficient use of several PC software packages for statistical programming and reporting. Statistical packages, spreadsheets, and word processors will be used interactively. Emphasis will be on gaining efficiency through use of appropriate programming sequences and macros and through transferring programs and macros across packages.

**12:15 pm - 4:00 pm**
**Ballroom E**

**Steering Committee Meeting**

**1:30 pm - 3:30 pm**
**Ballroom D**

**State University of New York Five-year Enrollment Planning Committee Meeting**

# NORTHEAST ASSOCIATION FOR INSTITUTIONAL RESEARCH

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# Reassessing Admission Policies at Public Universities: Cognitive vs Non-Cognitive Predictors of "Academic Success"

Marios H. Agrotes
Associate for Institutional Research
University at Albany, S.U.N.Y.

This paper examines the issue of cognitive vs. noncognitive predictors of academic success in American higher education. Sedlacek's work, with his set of noncognitive measures which do a better job of predicting academic success for black students than traditional admissions measures do, is reviewed.

Using University at Albany student survey and student tracking data, a number of noncognitive factors (some of them similar to Sedlacek's) were identified, using factor analysis. The factor scores of these factors, along with father and mother's education were then used as predictor variables in OLS Regression analyses, with "persistence toward graduation" as the criterion variable.

Separate analyses were conducted for the whole student group, white students only, all minority (excluding Asian Americans) students, black students only, and Hispanic students only. The results for the whole group of students and the white students were remarkably similar, undoubtedly because the large majority of students in the whole group were white. None of the predictor variables was statistically significant in affecting the persistence toward graduation for both all the students and the white students alone. The proportion of the variation in the dependent variable explained by the model in both these two groups, was tiny.

For all minority students, the results were somewhat better, with one of the predictor variables achieving significance. The proportion of the variation in the dependent variable explained by the model was somewhat better, but still not statistically significant.

When the minority student group was further divided into blacks and Hispanics and new regressions performed on the two sub-groups separately, the results changed dramatically. For Hispanic students, as for the whites, none of the predictor variables were statistically significant. The proportion of the variation in the dependent variable explained by the model was better still, but again not statistically significant. For black students alone, though, three of the predictor variables were significant at he .05 level. The proportion of the variation in the dependent variable explained by the model was pretty high, and highly significant.

## INTRODUCTION

The paramount purpose of American Higher Education should be to encourage and enable intentional developmental change in students throughout the life cycle (Chickering, 1981).

Especially in today's modern, industrialized and technological society, advanced educational attainment is a highly prized value, since expert knowledge, competence, training and skills are at a premium. Inequities in access to education generate other forms of structural inequality. For example, they make it even more

difficult for groups who are outside of the mainstream reward structure to alter their status within the social system.

For many years, access to education was limited for unfavored racial or ethnic groups, as part of categorical discrimination and exclusionary policies (Blackwell, 1981). Indeed, black students on white campuses are a relatively recent phenomenon. Less than forty years ago, over 90 percent of black students (approximately 100,000 in 1950) were educated in traditionally black schools - excluded from other institutions by law, custom, or financial barriers. In the South, segregation barriers made it impossible for blacks to attend white colleges. At the same time, few northern institutions were willing to enroll black students, partly because of stereotypical beliefs that blacks were unable to benefit from higher education and partly because of the social stigma attached to the black presence in white society (Gurin and Epps, 1975; quoted in Fleming, 1984).

Access to the widening educational opportunity structure largely depends upon the internal and external political climate of an institution, the dynamics of institutional behavior, and the quality of social and political pressure brought to bear on a state and on the nation as a whole, particularly in terms of responses to pressures for enduring social change which elevate the overall status of an unfavored group. Moreover, broad educational opportunities as a social process also depend on the degree to which persons belonging to such groups either have sufficient economic means to take advantage of new educational opportunities or can find external sources of financial assistance (Blackwell, 1981).

The landmark Supreme Court case of *"Brown v. The Board of Education of Topeka, Kansas"* in 1954 triggered efforts to achieve greater desegregation at all levels of formal education. These efforts intensified during the civil rights movement of the 1960s and were pushed ahead even further by the Civil Rights Act of 1964, Title VII of the requirements for federal contracts mandated by the U.S. Department of Labor and Equal Employment Opportunity Commission, and the Secondary Education Act of 1965 (Blackwell, 1981).

As a result of this gradual elimination of racially discriminatory barriers to higher education, more blacks began attending college in the 1960s and 1970s. Black enrollment increased more than twice as much as total enrollment. In Addition, some early 1970s estimates indicated that between 60 and 75 percent of black students were in predominantly white institutions (Boyd, 1974, Gurin and Epps, 1975; quoted in Fleming, 1984).

Because of this enormous increase in the interest of minority students in attending college, many barriers to access were challenged. The most important such barrier was traditional admissions standards of colleges and universities, especially the use of standardized tests (Nettles, 1986). In an attempt to remove these obstacles, and to provide opportunities for everyone to pursue a college education many colleges and Universities adopted open admissions policies or some form of special admissions policies for black students during the late 1960s and throughout the 1970s.

In the 1980s, however, greater pressure was applied to college administrators to reduce cost and increase quality. Higher admissions standards are believed by many to be the "best" means to achieve both cost reduction and higher quality; however, higher standards on potentially culturally and gender biased measures may also result in fewer minority students being educated at the college level. So, some formidable challenges remain to be faced by institutions of higher education in the United States in the quest for racial and ethnic equality, especially considering evidence from the last few years that black admissions are again declining (Smith, 1989).

How can colleges and Universities reduce cost and increase quality without adversely affecting the access of disadvantaged groups to higher education? The solution to these competing objectives requires a reexamination of the admissions criteria used to predict success in college. This is especially important if, as some evidence indicates, the performance of different population groups is best predicted on the basis of different sets of criteria (Nettles, 1986).

Traditionally, competitive colleges with limited resources, of which the University at Albany is an example, try to admit the best students among those who seem most likely to make the most out of it, those who display a potential for success in college. To estimate that potential of success in college, admissions officers traditionally use "predictors" such as high school grades, rank in class and standardized test scores.

These simple "rule of thumb" indicators are especially attractive to large public institutions which must consider thousands of applications with small admissions office staffs. For example, the Admissions Office at the University at Albany has only six professional staff to process more than 18,000 applications and make decisions to fill about 2,000 seats in a typical freshman class.

Given the charges that standardized tests used for this purpose seem to discriminate against women and minorities, and given the special responsibility of public universities like the University at Albany to best allocate public resources for the most equitable distribution of the benefits of higher education, the question is raised as to whether standardized tests discriminate, whether they have predictive power about success in college, and whether they can be augmented or replaced by non-cognitive measures which may do a better job of predicting success in college for certain disadvantaged groups.

This study will examine evidence from both sides of the cognitive vs non-cognitive debate. Special attention will be paid to the work of Sedlacek who has arguably isolated a number of non-cognitive predictors (e.g. motivation, support mechanisms, socioeconomic background) which, according to his research, are much better predictors of academic success for blacks than cognitive predictors. Finally, using University at Albany data, this study attempts to isolate non-cognitive predictors of academic success, and determine their similarity, if any, to Sedlacek's.

## LITERATURE REVIEW

The debate on cognitive vs. noncognitive admissions criteria has intensified over the last few years, especially with the barrage of attacks against the SAT and court decisions against its use as a sole criterion of awarding academic scholarships. In fact, however, it really is an old issue, present since the beginning of the widening of the efforts to achieve desegregation and equity in higher education. Throughout the 1960s and 1970s there were many debates regarding traditional college admissions policies, which were viewed by many as being racially and socioeconomically discriminatory.

On one side were the advocates of more liberal admissions policies that would offer greater options for increasing minority access to higher education. These advocates argued against the traditional predictors of college performance, suggesting that students' potential college achievement should not be predicted solely on the basis of their performance on college entrance tests, but rather on the basis of a variety of student characteristics. This view was supported by several study findings which suggested that the significant predictors of black students' performance were different from the predictors for white students. Clark and

Plotkin (1964) discovered that for black students entering predominantly white universities, success in college was dependent upon their motivation and goals regardless of their precollegiate performance or entrance examination indices. Similarly, Anastasi (1960) and Aiken (1964) found that students' biographical background mostly determined their success in college. These findings were further supported by Beasley and Sease (1974), who developed evidence that students' biographical characteristics and their extracurricular participation in student government, music, speech, science, mathematics, art, or writing organizations as well as their reasons for attending college, were all valid in predicting black students' college grade point averages and persistence.

Other researchers, such as Sedlacek, Brooks and Mindus (1968), Pruitt (1973), and Gibbs (1973), recommended that for black students such measures as educational aspirations, motivation, precollegiate preparation and experiences, and social and academic support be used as alternative college admissions criteria to traditional standardized tests, high school rank, and high school grade point averages.

On the other side were advocates of traditional admissions criteria. Their views were supported by several researchers during the same time period who focused on the validity of standardized entrance tests for predicting both black and white students' college performance. These researchers gave little or no attention to the validity of the non-traditional admissions criteria suggested above. Studies conducted by Stanley and Porter (1967) and Cleary (1968) found no significant racial differences in the value of standardized entrance tests and other precollegiate academic characteristics (i.e., high-school grades and rank) as predictors of college performance. Thomas and Stanley's (1969) correlational analyses showed that aptitude tests are better predictors of the college performance of black students than high-school grades. Thus, these researchers supported the view of maintaining traditional admissions criteria as valid success indicators for both minority and white students.

A newer line of research on student academic success is based on Tinto's model of student attrition (e.g., Tinto (1975), Pascarella and Terenzini (1980), Pascarella and Chapman (1983a and 1983b), Terenzini et al. (1985), and Stage (1988)). Tinto's model postulates that student attrition is based on both academic and social dimensions of the college environment. Inasmuch as minority students usually can have different social experiences on campus, this model allows for different academic success rates for whites and minorities not as predicted by traditional predictors (e.g., Pascarella, (1985))

## SEDLACEK'S WORK

Sedlacek has been championing non-cognitive predictors for over twenty years. He suggests that there are different educational processes involved in the academic success of white and black students, and he has tried to find and measure unique minority experiences which can be translated into useful predictors of academic success. Moreover he believes that traditional predictors such as grades and standardized tests simply reflect the racism in our society. (Sedlacek et al., 1968)

Sedlacek and Brooks (1976) and Sedlacek (1977) developed a set of non-cognitive variables, which were found to be good predictors of undergraduate student persistence, especially for black students, over a period as long as five years. Tracey and Sedlacek (1984) developed a non-cognitive questionnaire (NCQ) to measure these variables.

The eight non-cognitive variables are:

1) Positive Self-Concept or Confidence;
2) Realistic Self-Appraisal;
3) Understands and Deals With Racism;
4) Prefers Long-Range Goals to Short-Term or Immediate Needs;
5) Availability of Strong Support Person;
6) Successful Leadership Experience;
7) Demonstrated Community Service;
8) Knowledge acquired in a field.

It is hypothesized that these non-cognitive measures are better related to the process of academic success of black students on white campuses which is different from the process of white students.

## WHAT IS ACADEMIC SUCCESS

The concept of academic success is not easily operationalized in a single definition, and the literature has offered a variety of different definitions and operationalizations. Is someone who stays in college for six semesters more successful academically than someone who stays for four? Do course loads matter? Should cumulative grade point averages be considered? Is it fair to compare someone whose parents pay all the bills to someone who has to work full time while attending college? Is graduating in three years more successful than graduating in four or five? Do any of these measures really tell us how much a student has benefitted from a college education, or how well he or she will apply those benefits to his or her and society's betterment? This study need not engage the debate over definitions. For our purpose, it seems that the most important indicators of academic success is persistence toward graduation and graduation. The college attendance, and especially the possession of a degree, can open doors of opportunity and personal advancement that would not be otherwise available. For basic opportunities cumulative grade point averages are not particularly important. (Pace, 1979, Cohen, 1984, Volkwein et al, 1989) In this study using University at Albany data, we will therefore use persistence toward graduation, with special emphasis on *graduating*, as the criterion variable.

Another reason for selecting persistence rather than cumulative grade point average is that SAT score, one of the major traditional cognitive predictors of academic success, was designed by the Educational Testing Service to be a predictor for first year GPA only. Even though it would be interesting to know what predicts higher first year grades for University at Albany students, it will be more useful to know what predicts persistence toward graduation for these students.

## ANALYSIS USING UNIVERSITY AT ALBANY STUDENT DATA

Retention or persistence rates are different for black and white students in higher education, and in predominantly white institutions those differences are quite pronounced. Some studies have shown that traditional admissions predictors like SAT scores and high school grades and class rank are inadequate indicators of future academic success. Sedlacek and Brooks (1976) and Sedlacek (1977), developed a set of non-cognitive measures which they found to be better predictors of undergraduate student persistence for black students than white students.

This study will attempt to identify a set of similar non-cognitive measures using University at Albany data. We will then examine whether those measures can be used as valid and reliable predictors of academic persistence toward graduation, and whether their predictive values differ for white and minority students.

Data:

The data used in this study come from two sources: a) The 1986 Entering Student Survey at the University at Albany, which was administered to all the entering freshmen who participated in the summer orientation sessions in the summer of 1986. These questionnaires contain information about pre-college characteristics and attitudes of the students; b) The University at Albany's computerized student data tracking system. This provided information on whether the students who took the 1986 Entering Student Survey were still in school for each semester until the end of the Spring 1990 semester. In addition, the system provided information on whether those students graduated in May 1990.

Method of Analysis:

Using factor analysis, we identified a number of factors that demonstrated some similarity to Sedlacek's non-cognitive measures:

Factor 1: **Long Term Life Goals And Ambitions**
Similar to Sedlacek's "Prefers Long-Range Goals to Short-Term Immediate Needs"

Factor 2: **Political Involvement**
Somewhat similar to Sedlacek's "Successful Leadership Experience" and "Demonstrated Community Service"

Factor 3: **Intellectual Goals**

Factor 4: **Expectation Of Academic Success**

Factor 5: **Positive College Outcomes Confidence**
Similar to Sedlacek's "Positive Self-Concept or Confidence"

(Table 1 presents the variable loadings on each of the above factors.)

**TABLE 1**

**The Isolated Factors and their Variables**

| Factor 1: Long Term Life Goals And Ambitions | Loadings |
|---|---|
| Importance of Being Well Off Financially | .696 |
| Importance of Being Successful In Own Business | .684 |

| | |
|---|---|
| Importance of Having Administrative Responsibility | .649 |
| Importance of Raising A Family | .468 |
| Importance of Obtain Recognition From Colleagues | .449 |
| Importance of Being An Authority In My Field | .371 |

**Factor 2: Political Involvement**

| | |
|---|---|
| Importance of Influencing Political Structure | .754 |
| Importance of Keeping Up With Political Affairs | .648 |
| Desirable Class Characteristics: Participate In Class Discussion | .528 |
| Importance of Influencing Social Values | .510 |

**Factor 3: Intellectual Goals**

| | |
|---|---|
| Importance of Self Knowledge | .702 |
| Importance of Creative And Analytic Thought | .700 |
| Importance of Obtaining Liberal Education | .615 |
| Importance of Understanding Other Cultures | .472 |
| Importance of Gaining Career Skills | .402 |

**Factor 4: Expectation of Academic Success**

| | |
|---|---|
| Likelihood of Making At Least A 'B' Average | .736 |
| Likelihood of Graduating With Honors | .697 |
| Likelihood of Failing 1 Or More Courses (Negative Loading) | -.596 |

**Factor 5: Positive College Outcomes Confidence**

| | |
|---|---|
| Likelihood of Being Satisfied With College | .707 |
| Likelihood of Finding A Job In Preferred Field | .587 |
| Likelihood of Transferring to Another College | -.474 |

The factor scores for each of the above factors were included in an ordinary least squares (OLS) regression analysis as independent variables, along with father's and mother's education as the most suitable pre-college variables representing socioeconomic background. The variable *"persistence toward graduation"* was the dependent variable. Here, *"persistence"* is operationalized as the number of semesters a student has remained enrolled (possible range 1-8). Simply put, factor scores are estimates of the scores subjects would have received on each of the factors had they been measured directly. Discussing how they are calculated is beyond the scope of this paper, but the statistical package used here (SPSSX) can calculate these scores and save them for future use as was done here.

Of special interest was to examine whether the factors affecting persistence for minority students were similar to the ones for whites.

Even though more recently there has been an outcry about the bias of traditional standardized scores against women, most of the non-cognitive predictors theory and research on which this study is based on, has been done on blacks

compared to whites. Other racial and ethnic minorities face similar problems of educational access and opportunity, but have not been the subject of much research on this issue.

OLS regression runs were conducted first all students, then for white students only and then for all minority students, excluding Asian Americans. The minority students were further subdivided into cohorts of blacks and Hispanics and separate runs were performed to compare the two. Even though Hispanics as a group are considered disadvantaged, there exist numerous cultural and other differences to make us avoid assuming that the same non-cognitive variables will be as meaningful for each group in the same way.

## FINDINGS

Table 2 presents a summary of the unstandardized and standardized OLS regression coefficients, individual variable significance tests, R-Square, adjusted R-square, and F-Test significance information for the whole student group.

**TABLE 2**

OLS Regression Results

Summary of Unstandardized and Standardized OLS Regression Coefficients Predicting "Persistence" Toward Graduation

All Students

---------- Variables in the Equation ----------

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| Moth. Educ. | -.010282 | .056998 | -.006852 | -.180 | .8569 |
| FACTOR2 | .111662 | .071293 | .049324 | 1.566 | .1176 |
| FACTOR5 | .033455 | .072089 | .014687 | .464 | .6427 |
| FACTOR10 | -.005470 | .071559 | -.002409 | -.076 | .9391 |
| FACTOR13 | .088598 | .071603 | .039028 | 1.237 | .2162 |
| FACTOR3 | -.074149 | .071596 | -.032831 | -1.036 | .3006 |
| Fath. Educ. | .059409 | .054025 | .041971 | 1.100 | .2717 |
| (Constant) | 6.506688 | .208685 | | 31.179 | .0000 |

| | |
|---|---|
| Multiple R | .07958 |
| R Square | .00633 |
| Adjusted R Square | -.00061 |
| Standard Error | 2.26928 |

Analysis of Variance

N of Cases = 933

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Regression | 7 | 32.88715 | 4.69816 |
| Residual | 1002 | 5159.94949 | 5.14965 |

F = .91233 Signif F = .4959

As we can see from the table, none of the variables in this regression are statistically significant. The overall equation test of significance, which examines how well the model fits the data (Signif. F = .4959) is also non-significant, as reflected in the extremely low R-square of .00633. The statistic *Adjusted R-Square*, attempts to correct the R-square to more closely reflect the goodness of fit of the model in the population and not just the data sample, is especially more appropriate to use in this study with the widely varying number of cases in the different sample sub-groups. It is a much more conservative and stringent measure, but at the same time more realistic measure of the proportion of the variation in the population, explained by the model. It is therefore reported, and should be taken more seriously than the unadjusted R-Square. As we can see from the table, its value for the whole student sample is ten times lower than the unadjusted R-Square: -.00061 a miniscule value. In other words, these variables as a whole explain really none of the variation in the "persistence toward graduation" of the group of students as a whole.

Table 3 presents a summary of the unstandardized and standardized OLS regression coefficients, individual variable significant tests, Adjusted R-Square and F-Test significance information for the white student sub-group.

**TABLE 3**

OLS Regression Results

Summary of Unstandardized and Standardized OLS Regression Coefficients Predicting "Persistence" Toward Graduation

White Students

Variables in the Equation

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| Moth. Educ. | -.027237 | .059578 | -.018101 | -.457 | .6477 |
| FACTOR4 | -.031076 | .073963 | -.013776 | -.420 | .6745 |
| FACTOR1 | .081788 | .072887 | .036787 | 1.122 | .2621 |
| FACTOR3 | .055392 | .073771 | .024724 | .751 | .4529 |
| FACTOR5 | .085001 | .074197 | .037624 | 1.146 | .2522 |
| FACTOR2 | -.097073 | .073505 | -.043576 | -1.321 | .1870 |
| Fath. Educ. | .067280 | .056741 | .047115 | 1.186 | .2360 |
| (Constant) | 6.572752 | .220160 | | 29.854 | .0000 |

| | |
|---|---|
| Multiple R | .08084 |
| R Square | .00654 |

| | |
|---|---|
| Adjusted R Square | -.00098 |
| Standard Error | 2.24969 |

Analysis of Variance

N of Cases = 933

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|
| Regression | 7 | 30.79655 | 4.39951 |
| Residual | 925 | 4681.50784 | 5.06109 |

F = .86928 Signif F = .5303

---

As we can see from the table, these results are very similar to those to the whole group of students: none of the predictor variables in this regression are statistically significant, the overall equation test of significance for how well the model fits the data (Signif. F = .5303) is also non-significant, as reflected in the extremely low adjusted R-square of .00098. In other words, these variables as a whole explain really none of the variation in the "persistence" of white students in our sample as was the case with the whole group of students..

Table 4 presents a summary of the unstandardized and standardized OLS regression coefficients, individual variable significant tests, Adjusted R-Square and F-Test significance information for all the minorities except Asian Americans sub-group.

**T A B L E 4**

OLS Regression Results

Summary of Unstandardized and Standardized OLS Regression Coefficients Predicting "Persistence" Toward Graduation

All Minority Students

Variables in the Equation

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| Moth. Educ. | .308444 | .298902 | .190608 | 1.032 | .3086 |
| FACTOR4 | .009315 | .422093 | .003749 | .022 | .9825 |
| FACTOR3 | .430033 | .439075 | .153355 | .979 | .3336 |
| FACTOR2 | .287785 | .409941 | .107028 | .702 | .4869 |
| FACTOR1 | 1.226279 | .468533 | .412789 | 2.617 | .0127 |
| FACTOR5 | .260150 | .444343 | .093506 | .585 | .5617 |
| Fath. Educ. | -.260588 | .268428 | -.178906 | -.971 | .3378 |
| (Constant) | 5.471364 | .934839 | | 5.853 | .0000 |

---

| | |
|---|---|
| Multiple R | .41692 |
| R Square | .17383 |

| | |
|---|---|
| Adjusted R Square | .02164 |
| Standard Error | 2.51361 |

Analysis of Variance

N of Cases = 46

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|
| Regression | 7 | 50.51522 | 7.21646 |
| Residual | 38 | 240.09347 | 6.31825 |

F = 1.14216 Signif F = .3582

---

The group of variables as a whole is not significant (Signif F = .3582 and the variation in "persistence toward graduation" explained by these variables is only about 2% (Adjusted R- Square = .022). The fact that one of the predictor variables, FACTOR1 (*Long Term Life Goals and Ambitions*) is reported as statistically significant, is meaningless under these conditions. So, for the group of all minority students (except Asian Americans) the non-cognitive predictor variables do not function as reliable predictors of persistence toward graduation.

After we categorize the minority student group into black and Hispanic cohorts and conduct separate analyses the results become very interesting. Table 5 presents a summary of the unstandardized and standardized OLS regression coefficients, individual variable significant tests, Adjusted R-Square and F-Test significance information for black students only.

**T A B L E 5**

OLS Regression Results

Summary of Unstandardized and Standardized OLS Regression Coefficients Predicting "Persistence" Toward Graduation

Black Students Only

Variables in the Equation

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| Moth. Educ. | 1.086494 | .448913 | .592090 | 2.420 | .0270 |
| FACTOR2 | .926814 | .501109 | .319633 | 1.850 | .0818 |
| FACTOR3 | .870305 | .525275 | .301584 | 1.657 | .1159 |
| FACTOR5 | .206772 | .475180 | .075078 | .435 | .6689 |
| FACTOR4 | .937878 | .638384 | .279095 | 1.469 | .1601 |
| Fath. Educ. | -1.000604 | .355439 | -.566740 | -2.815 | .0119 |
| FACTOR1 | 1.297401 | .620290 | .442608 | 2.092 | .0518 |
| (Constant) | 4.866816 | 1.414962 | | 3.440 | .0031 |

| | |
|---|---|
| Multiple R | .74794 |
| R Square | .55942 |
| Adjusted R Square | .37800 |
| Standard Error | 2.12697 |

Analysis of Variance

N of Cases = 25

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|
| Regression | 7 | 97.65218 | 13.95031 |
| Residual | 17 | 76.90782 | 4.52399 |

F = 3.08363 Signif F = .0273

---

In this table we can see that three of the independent variables are statistically significant. Both father's and mother's education were significant. Also, FACTOR1 (*Long Term Life Goals And Ambitions*) was borderline significant.

The group of variables as a whole explain a relatively high 37.8 percent (Adjusted R- Square = .378) of the variation in "persistence toward graduation" and this is also reflected in the F statistic (Signif. F = .0273) which indicates how well our model fits the data.

Table 6 presents a summary of the unstandardized and standardized OLS regression coefficients, individual variable significant tests, Adjusted R-Square and F-Test significance information for Hispanic students only.

**TABLE 6**

OLS Regression Results

Summary of Unstandardized and Standardized OLS Regression Coefficients Predicting "Persistence" Toward Graduation

Hispanic Students Only

Variables in the Equation

| Variable | B | SE B | Beta | T | Sig T |
|---|---|---|---|---|---|
| Moth. Educ. | -.536831 | .367405 | -.383015 | -1.461 | .1677 |
| FACTOR4 | .327532 | .533966 | .152598 | .613 | .5502 |
| FACTOR1 | .882483 | .715217 | .285881 | 1.234 | .2391 |
| FACTOR3 | -.261444 | .641412 | -.090594 | -.408 | .6902 |
| FACTOR5 | -.167774 | .753410 | -.057394 | -.223 | .8272 |
| FACTOR2 | -1.095962 | .615201 | -.440665 | -1.781 | .0982 |
| Fath. Educ. | .585997 | .367338 | .489935 | 1.595 | .1347 |
| (Constant) | 5.666440 | 1.239736 | | 4.571 | .0005 |

---

| | |
|---|---|
| Multiple R | .66395 |
| R Square | .44083 |
| Adjusted R Square | .13973 |
| Standard Error | 2.23190 |

Analysis of Variance

N of Cases = 21

| | DF | Sum of Squares | Mean Square |
|---|---|---|---|
| Regression | 7 | 51.05175 | 7.29311 |
| Residual | 13 | 64.75777 | 4.98137 |

F = 1.46408 Signif F = .2622

---

We can see in this table that, as with the white student group, none of the independent variables here are statistically significant. Adjusted R-Square is almost 14%, but the F-test (Signif F = .2622) tells us that this is statistically insignificant.

## CONCLUSIONS

These results confirm Sedlaçek's claim that there exist certain non-cognitive variables that do a good job of predicting the academic success of black students.

This study hopefully has informed the policy debate over access as related to the issue of admissions, the validity of the criteria they use, and the intensifying debates on the use of alternative criteria at least for some groups. The research literature of higher education policy clearly suggests the need for new approaches to admissions decisions which are neutral with regard to gender and racial and ethnic background. This study presents evidence that non-cognitive measures may indeed be useful predictors of academic success for minority groups. Further, the study has shown that such indicators must be chosen in consideration of specific minority cohorts.

American higher education policy must therefore move away from the exclusive use of cognitive admissions criteria and develop noncognitive alternatives which are appropriate to the major cultural and ethnic groups which have traditionally been adversely affected by the exclusive use of cognitive instruments.

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# ACCOMMODATING TEAM MEMBER COGNITIVE STYLES

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For any team to be successful, the cognitive styles of the members must be accommodated. To accommodate various styles, the team members must know what those styles are and what the implications are for teamwork. This paper reviews the importance of teamwork in institutional research. It explores the use of David Kolb's experiential learning theory to develop successful administrative teams in colleges and universities.

One might say that college and university administrators are the best educated managers, since most have one or more advanced degrees. However, one might also say that they are the worst educated managers, since their advanced degrees are often in fields other than educational management (Dieterich, 1986). Even managers with management training often lack the skills necessary to deal effectively with a team. One manager, with an MBA from Stanford University, had two intense years of management education, but had never been required to take a single course that dealt with team building, improving communication skills, leadership development, and creative problem solving (Brown, 1987).

Currently, a new information-based society is emerging that requires specific skills. Zuboff (1988) discusses the need for teamwork in In the Age of the Smart Machine. She mentions two scenarios. On one hand, technology can be used to automate the work force achieving unprecedented speed and consistency, while at the same time increasing the impersonality and remoteness of management. On the other hand, technology can be used to "informate" the work force, empowering ordinary working people with the information needed to make critical and collaborative judgments. An essential requirement for the informating strategy includes an emphasis on teams, participation, and decentralization.

In this new information-based society, the institutional researcher plays an important role providing the information needed for collaborative judgments. By definition, "institutional research is research conducted within an institution of higher education to provide information which supports institutional planning, policy formation and decision making" (Saupe, 1990, p. 1).

Institutional researchers must also learn to function well at social, emotional, and political levels since most are regularly members of various teams including top management teams, ongoing and special committees, task forces, project teams, study teams and so on. Teamwork is therefore both an important and a necessary aspect of institutional research. As a result, institutional researchers need various people skills including communication, group roles, team building, and problem solving (Terrass, and Pomrenke, 1981). This paper deals specifically with teamwork.

What is a team? Francis and Young (1979) define a team as "an energetic group of people who are committed to achieving common objectives, who work well together and enjoy doing so, and who produce high quality results" (p. 8).

The goal of this paper is to acquaint institutional researchers with a theory of cognitive style that will allow for more effective teams. Exactly what is cognitive style? A number of researchers have defined cognitive style. Perkins (1981) defines cognitive style as recurrent patterns in the way a person approaches problems and processes information. Vasarhelyi (1977) defines it as "the way a person organizes information" (p. 139). According to Miner (1988) "cognitive style refers to the characteristic ways in which people process and evaluate information" (p. 140). Schweiger (1983) states that cognitive style relates to the characteristic way in which an individual solves problems and makes decisions.

There are many models of cognitive style. One especially appropriate to the development of a team is David Kolb's experiential learning theory (Kolb, 1974; Kolb, 1984). According to Kolb, learning encompasses creativity, problem solving, and decision making. He identified four cognitive styles: converger, diverger, assimilator, and accommodator as shown in figure 1. Much as been written concerning Kolb's four cognitive styles. For example, see Kolb (1974), Kolb (1981), Kolb (1984), Smith and Kolb (1986), Alavi and Henderson (1981), Taggart, Robey, and Kroeck (1985), Sugarman (1985), and Claxton and Murrell (1987).

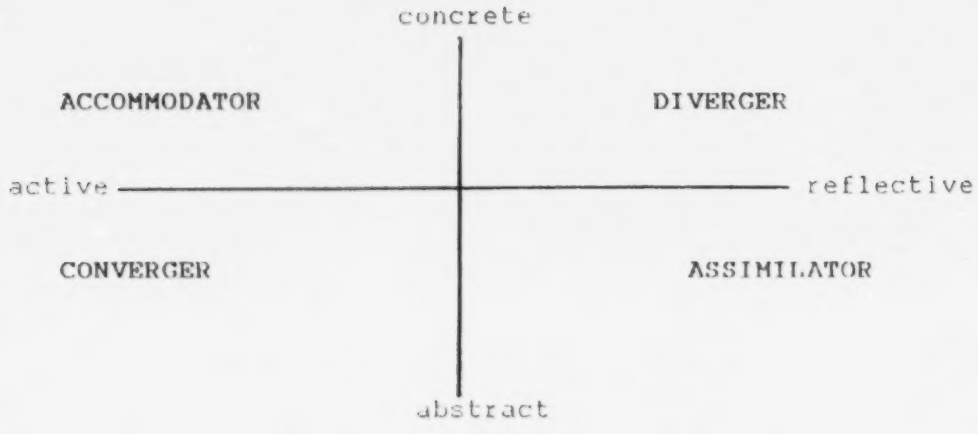


**Figure 1.** Kolb's cognitive styles (1984).

Individual cognitive styles can be identified using the Kolb Learning Style Inventory (LSI)*. The LSI is an easy-to-use self-scoring test that helps people understand how they learn, solve problems, and generally deal with day-to-day life situations. The test is a twelve item questionnaire. It can be completed and scored in approximately 20 minutes. The LSI has been used in a number of settings. It has been used to help students discover their own cognitive styles. It has been used to describe the predominant cognitive styles of various professional groups. It has been used to assess the relationship of cognitive style to student achievement. Suggested applications for the LSI include personal development, managerial training, team building, and training design (Kruzich, Friesen, & Van Soest, 1986). Following is a summary of each of the four cognitive styles as identified by Kolb's LSI (Kolb, 1984; Smith & Kolb, 1986).

The converger's greatest strength lies in problem solving, decision making, and the practical application of ideas. This style seems to do best in situations where there is a single correct answer or solution to a question or problem. Through hypothetical-deductive reasoning, focus is on specific problems. Convergers are relatively unemotional, preferring to deal with things rather than people. They prefer dealing with technical tasks and problems rather than social and interpersonal issues.

The diverger has the opposite learning strengths of the converger. Their greatest strength lies in imaginative ability and awareness of meaning and values. They excel at

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*The LSI is available from McBer & Company, 137 Newbury Street, Boston, MA 02116. (617) 437-7080

viewing situations from many perspectives. They perform better in situations that call for a generation of alternative ideas such as a brainstorming session. Divergers are interested in people, and tend to be imaginative and emotional.

The assimilator's greatest strength lies in the ability to create theoretical models. They excel in inductive reasoning. They are concerned about abstract concepts. For this style it is important that the theory be logically sound and precise. In situations where the theory or plan do not fit the facts, assimilators would be likely to disregard or reexamine the facts.

The accommodator has the opposite learning strengths of the assimilator. Their greatest strength lies in doing things, in carrying out plans and experiments and in involving themselves in new experiences. They tend to be more of a risk taker than people with the other three cognitive styles. People with this style solve problems in a trial and error manner.

| ACCOMMODATOR | DIVERGER |
|---|---|
| EXECUTIVE JOBS: | PERSONAL JOBS: |
| Manager | Counselor |
| Educational Administrator | Personnel Manager |
| Accountant | Artist |
| Marketing Specialist | Nurse |
| **CONVERGER** | **ASSIMILATOR** |
| TECHNICAL JOBS: | INFORMATION JOBS: |
| Farmer | Planner |
| Computer Programmer | Teacher |
| Engineer | Writer |
| Medical Technician | Librarian |

Figure 2. Favored careers by cognitive style.

Research shows that people choose occupations that are consistent with their cognitive styles as in figure 2 (Smith & Kolb, 1986). Furthermore, if there is a mismatch between the individual's cognitive style and the job situation's cognitive style, the person will be more likely to change jobs rather than change cognitive style (Hunsaker & Alessandra, 1980).

The accommodator style is most often found in executive jobs. These positions require a strong orientation to task accomplishment and decision making under uncertainty.

Examples of accommodator style jobs include manager, educational administrator, accountant, and marketing specialist.

The diverger style gravitates towards personal jobs that require personal relationships and effective communication with other people. Examples of diverger style jobs include counselor, personnel manager, artist, and nurse.

Technical jobs, involving technical and problem-solving skills require the converger style. Examples of converger style jobs include farmer, computer programmer, engineer, and medical technician.

Persons with the assimilator style prefer working in information jobs. Examples of assimilator style jobs include planner, teacher, writer, and librarian.

As a result of this tendency to choose occupations that are consistent with one's cognitive style, college administrators can be clustered into the four cognitive styles based on functional area as shown in figure 3 (Bailey, 1990). Of course, this model deals with the average and not all team members will fit into the designated cognitive styles. Never-the-less, this model is a starting point when dealing with team effectiveness. It will help team members to understand themselves, as well as the other members of the team.

| | |
|---|---|
| PRESIDENT<br>PUBLIC AFFAIRS<br>ADMISSIONS<br>DEVELOPMENT<br>ALUMNI AFFAIRS<br>ACCOUNTING<br>FINANCE<br>PURCHASING<br>REGISTRAR | RESIDENCE LIFE<br>FINANCIAL AID<br>COUNSELORS<br>CAREER SERVICES<br>DEAN OF STUDENTS |
| Accommodator<br>I | Diverger<br>II |
| IV | III |
| Converger | Assimilator |
| COMPUTING SERVICES | PLANNING<br>INSTITUTIONAL RESEARCH |

**Figure 3.** Cognitive styles of higher education administration.

Clustered in block I in the executive jobs that require accommodator skills, are the president, public affairs, admissions, development, alumni affairs, accounting, finance, purchasing, and the registrar. Block II, the personal jobs that require diverger skills, includes residence life, financial aid, counselors, career services, and dean of students. Block III, the information jobs that require assimilator skills, includes planning and institutional research. Block IV includes the technical jobs that require converger skills such as those found in the computer services department.

Looking at figure 3, you will see the challenge that teams face. Research shows that people tend to understand and appreciate people whose minds work like their own (McCaulley & Natter, 1974). Furthermore, functional areas that are most different in cognitive style have the most difficulty communicating with one another (Smith & Kolb, 1986). The team members in blocks I, II, and IV do not share the cognitive style of those in institutional research. The team members in block I, in the executive jobs, are the most different in cognitive style from the institutional researchers.

This paper proposes that the institutional researchers should know the cognitive styles of team members. What are the implications? Each of the four styles has certain strengths and weaknesses. No one style is better than another.

According to Myers (1987) a successful team demands a variety of cognitive styles. The clearest vision of the future comes from an assimilator in an information job, the most practical realism from an accommodator in an executive job, the most incisive analysis from a converger in a technical job, and the most skillful handling of people from a diverger in a personal job.

Opposite styles can complement each other in any teamwork. When people with different styles approach a problem, each sees things not visible to the others. However, opposite styles can also cause friction. When opposites must work together on a team, an understanding of the differing styles can prevent friction. The team members in executive jobs have the opposite cognitive style of the team members in information jobs. In other words, the majority of college administrators have a cognitive style that is opposite of that of institutional researchers. Furthermore, team members in personal jobs have the opposite cognitive style of the team members in technical jobs. The strengths of each cognitive style can balance the weaknesses of the opposite cognitive style. The following shows how to accommodate this difference (Myers, 1987).

The assimilator institutional researchers in information jobs need the accommodators in the executive jobs:

- o To bring up pertinent facts
- o To face the realities of the current situation
- o To apply experience to problems
- o To focus on what needs attention now
- o To keep track of essentials
- o To face difficulties with realism

The accommodators in executive jobs need the assimilator institutional researchers in information jobs:

- o To bring up new possibilities
- o To read the signs of coming change
- o To focus on preparing for the future
- o To keep the big picture in mind
- o To anticipate trends

The divergers in personal jobs need the convergers in technical jobs:

- o To analyze consequences and implications
- o To organize
- o To find the flaws in advance
- o To reform what needs reforming
- o To stand firm against opposition
- o To fire people when necessary

The convergers in technical jobs need the divergers in personal jobs:

- o To persuade
- o To forecast how others will feel
- o To arouse enthusiasm
- o To teach
- o To appreciate what is right

Knowing the implications of team member cognitive styles can improve team assignments and team decisions (Thomas, 1986). A flexible environment that accommodates differences in cognitive style, provides the environment needed for effective teamwork. What is a team? It is "an energetic group of people who are committed to achieving common objectives, who work well together and enjoy doing so, and who produce high quality results" (Francis and Young, 1979, p. 8). My challenge to you is to know your team members, know their cognitive styles. More importantly, know yourself and know your own cognitive style.

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# Anticipated Academic and Personal Concerns of Students Prior to Transferring to a Four-Year Institution: An Initial Report

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## ABSTRACT

A survey was developed and administered to approximately 130 community college students who planned to transfer to a four-year institution. Students indicated their anticipated academic and personal concerns prior to transferring. Students will be re-surveyed next year to determine which concerns were actually experienced. Benefits to academic advising and recruiting will be discussed.

## Introduction

Four decades ago, Bogue (1950) said that traditionally, the community college has "...felt little or no responsibility for the college-preparatory student once he (or she) has transferred to a four-year institution" (p.20). Nearly two decades ago, Zwerling (1976) in his landmark book, Second Best: The Crisis of the Community College, stated that "...it is generally agreed that the mere fact of enrolling in a community college significantly reduces a student's chances of achieving his or her academic objectives" (p.56). Hills (1965) introduced the term "transfer shock" to describe the decline in the grade point average of community college students after they transfer to a four-year institution.

Still today, all too often, community college students are left to fend for themselves once they transfer to a four-year institution. The community college is finished with them as they pass through the doors for the final time. Unfortunately, many four-year institutions do not follow up with them once they have been admitted. Consequently, the concerns of transfer students often remain unknown to those at the community college as well as to the four-year institutions.

For community college transfer students to be successful at both institutions, perceptions of their academic and social concerns should be investigated. This study is an initial attempt to learn the academic and social concerns of community college students prior to transferring and, in on-going research, compare these concerns in a follow-up study with concerns actually realized once on a four-year campus.

## Literature Review

The transfer function of the community college has a rich history dating from the very beginnings of the movement three quarters of a century ago. Eells (1928; 1931) stated that preparation of transfer students was one of the most important functions of the early junior colleges. For Eells,the transfer education available at a junior college served as a "shock-absorber" for the university.

Astin (1977); Fernandez, Raab, and Smith (1984); and Cohen, Brawer and Bensimon (1985) have measured the academic performance of community college transfer students. Kintzer and Wattenbarger (1985) investigated the patterns and directions of transfer education after Lombardi (1979) and Cohen (1979) raised questions of how to define the transfer student. Astin (1983) predicted a renewed growth in transfer students because of increasing tuition costs at four-year institutions. Recently, four-year institutions have started to compete with community colleges for enrollment. In fact, Adelman (1988) reported that 20% of associate degrees in 1987 were awarded by four-year institutions.

Fairweather and Smith (1985) recommended that both community colleges and four-year institutions make the transfer process as relatively trouble-free as possible. Thus, a trend developed in the 1980s to address the issue of compatibility of transfer curriculum by establishing articulation agreements between community colleges and four-year institutions.

Cohen, Brawer and Bensimon (1985) reported that 43% of community college faculty in their study said that their course content was influenced a great deal by what is taught in four-year institutions. While such agreements usually are based on the general subject matter of courses, Kissler, Lara and Cardinal (1981) pointed out, in addition, that community colleges should examine the rigor and quality of their transfer curriculum in comparison to such standards at the university.

However, articulation agreements do not ensure that the reading level of textbooks, the quality of writing assignments, use of the library, or grading standards are equivalent between community colleges and four-year institutions. Richardson, Fisk and Okun (1983) believed that restructuring the content of community college transfer courses to correspond with those at the local state university may not solve the problems of articulation. They stated that the emphasis should be on transferable skills rather than on transferable content.

Thus, the transfer responsibility of the community college may go beyond establishing articulation agreements and improving academic standards. The responsibility extends to identifying student perceptions of what their university experiences will be like and taking steps to help students adjust their perceptions to reality.

A first step in this conceptualization of the transfer process is learning the perceptions of transfer students. Community colleges and four-year institutions need to identify and to address student perceptions prior to transferring. This study reports on initial research on the academic and personal perceptions of community college students prior to transferring to a four-year institution. A follow-up study which surveys students after they have transferred is in progress. To date, fifty-one students have completed the second survey.

## Methodology

The study began in the Fall 1988 and concluded in the Spring 1990. The sample consisted of 130 students who identified themselves as intending to transfer to a four-year institution. Students were enrolled in one of two Maryland community colleges.

One college, with a 1989-1990 enrollment of 10,000, is located in a semi-urban, middle-class environment. It is nearly thirty-years old and is a highly respected community college. The second college, with a 1989-1990 enrollment of 3,000 is located in a rural, lower-to-middle class environment. It is over twenty years old and is emerging as a vital force in the future of a rapidly expanding county.

Students at both institutions were similar regarding gender, race, age and grade point average. At both colleges, students were enrolled in psychology or philosophy courses taught by senior faculty. These two courses were selected because they provided a representative cross-section of potential transfer students who enroll for social science or humanities electives.

The survey was developed by the senior author after informal discussions with students and was pre-tested for a semester prior to this study. It was administered anonymously to students during the sixth to eighth week of each semester and required approximately fifteen minutes to complete. The survey measured anticipated academic and personal concerns prior to transferring to a four-year institution. Since the methodology was phenomenological, terms were not defined on the survey; the focus was on student perceptions.

## Results

The respondent sample consisted of 50 male and 80 female students. Their most frequent program of study was general studies (57%), followed by business-oriented programs (16%). Nearly 67% had first enrolled in the three years prior to the study and were 18 years old when enrolled. The average age of the respondents was 20 years. Nearly 40% were full-time students, were enrolled for 12-16 semester hours, and had completed an average of 21 semester hours prior to the study.

A majority (55%) of the respondents had not applied for admission to a four-year institution directly from high school. The main reasons given for not applying to a four-year institution were finances (15%), distance from home (8%), and uncertainty about career plans (8%). The most frequent reasons for attending a community college included: close proximity to home (46%), finances (37%), program of study (17%), and recommendation of parents (16%).

Table 1 lists descriptive statistics for academic skills perceived to be needed prior to enrollment compared with those developed after enrollment.

Table 1

Comparison of Academic Skills Needed Versus Achieved
at the Community College
N=130

| Skill | Mean | SE Mean | t |
|---|---|---|---|
| Reading | -.131 | .054 | 2.42* |
| Study Skills | .046 | .050 | 0.93 |
| Mathematics | .146 | .045 | 3.24** |
| Artistic/Creativity | .000 | .036 | 0.00 |
| Scientific | -.038 | .040 | 0.95 |
| Critical Thinking | -.169 | .051 | 3.31** |
| Writing | -.046 | .054 | 0.85 |
| Oral Presentation | .108 | .044 | 2.45* |
| Physical/Athletic | .038 | .035 | 1.08 |
| Career/Vocational | .031 | .033 | 0.94 |

*p<.05; **p<.01

When comparing these academic skills needed versus achieved, respondents said they developed their reading and critical thinking skills significantly more than they thought they would be needing ($t=2.42$, $p<.05$ for reading skills; $t=3.31$, $p<.01$ for critical thinking skills).

Conversely, however, when respondents compared two other skills, mathematics and oral presentation, significantly fewer students actually developed these skills than reported needing development prior to enrollment ($t=3.24$, $p<.01$ for mathematics; $t=2.45$, $p<.05$ for oral presentation skills).

Table 2 highlights descriptive statistics comparing personal skills reported to be needed prior to enrollment and actually developed at the community college.

Table 2

Comparison of Personal Skills Perceived as Needed and Developed at the Community College
N=130

| Skill | Mean | SE Mean | t |
|---|---|---|---|
| General Self Confidence | .077 | .045 | 1.71 |
| Meeting New People | -.054 | .040 | 1.35 |
| Making New Friends | -.092 | .043 | 2.14* |
| Talking with Authority | -.038 | .033 | 1.15 |
| Sharing Myself with Friends | -.031 | .039 | 0.79 |
| Speaking During Class | .154 | .053 | 2.90** |
| Giving Speech Before Group | .169 | .051 | 3.31** |
| Attending Social Functions | .131 | .037 | 3.54** |
| Support of Spouse/Family | .015 | .024 | 0.62 |
| Support of Friends | .000 | .027 | 0.00 |

*p<.05; **p<.01

As shown, respondents said they made new friends significantly more than they thought they needed prior to enrollment. When comparing three other skills, however, respondents said they did not achieve as many gains as they thought they needed. As shown in Table 2, respondents said they did not develop their skills in speaking during class, giving a speech, or attending social functions as much as they thought they needed prior to enrollment.

## Discussion

Students often perceive themselves as arriving on campus with academic deficiencies in study, critical reasoning, writing, and mathematical skills. These deficiencies, although not reported as such by students in this study, may have been a hidden reason for not applying to a four-year institution. However, the community college appears to have been successful in remedying these deficiencies, at least as perceived by respondents. For example, 65% said that thinking and critical reasoning were their most improved academic skills, and 60% listed study skills as improved.

Thus, many respondents perceived themselves as arriving on campus with academic deficiencies and the community college as addressing these needs. However, some respondents may have perceived a skill as still needing development because the student had not yet completed a specific course in that skill area.

For example, 26% of the sample reported their mathematical skills had not been developed at a community college, but some of this 26% may not have enrolled in an advanced math course. Many community college students fear college-level math courses and often delay fulfilling this requirement until the last possible semester. In addition to anxiety over mathematics courses, many students react similarly to speaking in front of a group. Those students who reported they had not developed oral presentation skills may not have enrolled or completed a speech course.

Many community college students transfer to a four-year institution with approximately 30 hours of credit and without earning an associate degree. Because many of the students in this sample were approaching 30 credit hours, they may have likely been at a transition point and were preparing psychologically for transfer.

Thus, because the choices were not mutually exclusive, these students may have marked both "developed" and "needing development" for the same skill. Although they may have felt certain skills had improved during their tenure at the community college, they may have been experiencing renewed anxieties about the strength of their skills as they prepared to transfer to a four-year institution. In other words, the sense of academic inadequacies which accompanied many students to the community college, although perceived as improved somewhat, may have been resurfacing as students realized that they would soon be entering a new academic environment with new demands.

### Implications for College Officials

This study investigated how students perceive themselves and their educational experiences prior to and during enrollment at a community college. The results of this study suggest the need for greater exchange of information between community colleges and four-year institutions on the academic and social concerns of transfer students.

For example, community colleges should make periodic evaluations of their success in preparing students socially as well as academically for transfer. In turn, four-year institutions might evaluate their success in assimilating transfer students from community colleges. Faculty at both institutions may wish to examine how they introduce academic requirements of their courses once they are aware of student academic and social concerns. Knowing, for example, that students are concerned about their study skills, may guide faculty toward serving as mentors to students and help them through the transfer process.

Administratively, the results of this study could be helpful in recruitment and retention. Recruiters could share with potential students how their institution addresses student concerns. Retention might be improved by a series of activities sponsored by student services staff aimed particularly at transfer students. An especially important activity might be an advisement program consisting of students who have successfully transferred to a four-year institution who can personally

answer similar questions by students who are getting ready to transfer. In addition, a network of transfer students might be developed that could offer support to each other.

Finally, investigations of the academic and personal needs of specific student constituencies such as women, non-traditional, and part-time students may prove beneficial in advising, retention, and, most importantly, student success.

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# Evaluating Institutional Efforts to Compensate Faculty

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In response to the erosion in faculty salaries that occurred during the seventies and early eighties, many colleges and universities have devoted substantial resources to improve the salaries paid to their faculty. For most private institutions this has entailed substantial increases in tuition, which has frequently provoked dissatisfaction among students, parents, trustees and the general public.

In this paper I present a model that accounts for the correlation between average faculty salaries, tuition levels and enrollment using multiple regression analysis. The data for the regression analysis are data on tuition, enrollment, faculty size and average faculty salary for groups of colleges and universities.

I begin with a critique of a typical approach to evaluating average faculty salaries by rank-ordering the average faculty salaries of a group of (comparable) institutions. This method of analysis fails to explain the position of any institution in the rank-ordering, and implicitly assumes that the level of available resources and expenditure commitments are (or ought to be) the same. Then I discuss some of the features of a model to explain how colleges and universities compensate their faculty. This model helps to account for an observed correlation between average faculty salaries and tuition levels among a group of private Pennsylvania colleges and universities. I then discuss how multiple regression analysis and the analysis of residuals can be used to evaluate efforts to compensate faculty.

The data for these groups of colleges and universities show a strong correlation between tuition and average faculty salaries. Residual analysis indicates schools that are "over-paying" and "under-paying" their faculty, given their tuition levels. The data also show that for the average institution in this group, a 5% increase in the average faculty salary would require a 6% increase in tuition if enrollment remains constant and if there are no increases in other revenues.

Regression analyses on data including faculty salaries that are reported in the literature are confined to questions about the existence of unfair biases (e.g., different salaries for male and female or minority and non-minority faculty). The dependent variables used are categorical variables such as sex, race, time in rank, degrees earned, and discipline. The technique of regression analysis is used to discover statistically significant differences from the normal salaries paid for members of certain groups (e.g., female or minority faculty).

The statistical techniques described below are the same as those presented in the literature. However, the purpose of the analysis, the data analyzed and the kind of population sampled are different. Specifically, the population to be sampled is the universe of colleges and universities; the data for analysis are data on institutional characteristics; and the purpose of the analysis is to evaluate average faculty salary levels among colleges and universities in the sample in the context of economic variables that are relevant to determining the level of faculty salary expenditures. The techniques presented in this paper would be helpful in institutional research on comparative or competitive institutions. Perhaps the most important application of the model is to assist in explaining to groups such as faculty or board members the relative success or failure of an institution's efforts to compensate its faculty.

A typical method for evaluating faculty compensation at an institution involves collecting salary data from institutions in a selected group and then to compare the salary data from one institution with a univariate statistical measure (e.g., mean or percentile rank) of the group data. This is the analytic technique used in the AAUP's Annual Report on the Economic Status of the Profession. This technique is incomplete, if not misleading, by failing to use data about members of the comparison group which is relevant (either in terms of some statistical measure like correlation, or in terms of some model of the factors that influence institutional efforts to compensate employees) to the institution's salary data.

A common analysis of the average salary paid to faculty is to rank the average faculty salaries paid at institutions in some comparative group, and to evaluate an institution's average faculty salary by referring to its rank order among this group. Table 1 shows one such rank ordering.

Table 1: Ranking by Average Faculty Salary

| | Average Salary |
|---|---|
| A | $53,500 |
| B | $48,600 |
| M | $46,300 |
| N | $42,200 |
| C | $42,000 |
| D | $40,600 |
| O | $40,000 |
| E | $40,000 |
| P | $39,000 |
| Q | $38,600 |
| R | $37,500 |
| F | $37,400 |
| S | $36,900 |
| T | $36,900 |
| U | $36,700 |
| V | $35,800 |
| W | $35,500 |
| X | $35,100 |
| Y | $34,100 |
| G | $33,900 |
| Z | $33,700 |
| H | $33,400 |
| AA | $33,300 |
| I | $33,300 |
| AB | $33,200 |
| AC | $32,800 |
| AE | $32,200 |
| AD | $32,200 |
| AG | $32,000 |
| AF | $32,000 |
| AH | $30,900 |
| AI | $30,800 |
| AJ | $30,700 |
| AK | $30,600 |
| J | $29,900 |
| AL | $29,600 |
| K | $29,500 |
| AM | $29,500 |
| AN | $29,400 |
| AO | $29,100 |
| AP | $29,000 |
| AQ | $28,500 |
| L | $28,300 |
| AR | $28,000 |
| AS | $27,600 |
| AT | $26,900 |
| AU | $26,600 |
| AV | $26,500 |
| AW | $25,500 |
| AY | $25,100 |
| AX | $25,100 |
| AZ | $24,900 |
| BA | $24,700 |
| BB | $23,800 |
| BC | $21,600 |
| BD | $21,400 |

The rank-ordering method may be used so frequently because it reveals exactly what prospective employees will weigh when considering offers of employment, namely how the local institution's salary compares with salaries offered by other institutions competing for faculty. Also, it minimizes the amount of data which must be collected and analyzed. Finally, the concept of a rank order is easy to understand, and so is more amenable than other statistical methods to the kind of executive reporting that is requested from offices of institutional research.

However, this method of analysis is unsatisfactory for evaluating institutional efforts at compensating faculty. This method of analysis assumes that the institutions in the comparison group are sufficiently like the local institution that differences in salary paid at these institutions are not caused by institutional factors that are qualitatively different for institutions in the group. In the case of the above table, categorical variables such as location, Carnegie classification and institutional control are used to ensure the homogeneity of the institutions included.

The chief shortcoming of this method is that it fails to explain why a particular institution occurs at a given place on the list. Implicitly, it assumes that all institutions in the comparison group can budget faculty salary expenditures at the same levels, but for some mysterious (perhaps malicious) reason, fail to do so.

Any collection of institutions in a comparison group is susceptible to criticism on the grounds that there are extenuating circumstances which invalidate the implicit comparison of the institutions. While I do not wish to commit the fallacy of special pleading, I would argue that the method of rank order evaluation is an inadequate method for evaluating how well colleges and universities compensate their faculty. It is inadequate because it does not account for the influence of factors which normally have a significant effect on the salaries paid to faculty.

Instead of rank ordering a group of institutions by some indicator of faculty salaries, such as average faculty salary, the method I describe takes into account not only the institution's performance on faculty salaries compared with some group of peer institutions, but also takes into account variables which are relevant to the institution's performance on faculty salaries.

One way to incorporate a relevant variable is to display information about the variable along with information about performance on faculty salaries in a rank ordered list. Table 2 is an example of this approach. In this table, the same institutions are represented as in Table 1. The second column displays information about a relevant variable, namely the tuition and fees charged to undergraduates by the school. The schools are ranked in decreasing order by tuition and fees charged. In the third column, the average salary paid to full-time faculty at that institution in the same year is listed.

Table 2: Ranking by Undergraduate Tuition & Fees

| | Undergraduate Tuition & Fees | Average Salary |
|---|---|---|
| M | $13,230 | $46,300 |
| N | $12,675 | $42,200 |
| C | $12,460 | $42,000 |
| O | $12,460 | $40,000 |
| B | $12,450 | $48,600 |
| R | $12,200 | $37,500 |
| E | $12,155 | $40,000 |
| S | $12,140 | $36,900 |
| A | $12,080 | $53,500 |
| P | $12,025 | $39,000 |
| T | $11,720 | $36,900 |
| AC | $9,880 | $32,800 |
| AA | $9,785 | $33,300 |
| Z | $9,740 | $33,700 |
| V | $9,565 | $35,800 |
| O | $9,540 | $38,600 |
| D | $9,050 | $40,600 |
| AB | $9,000 | $33,200 |
| AJ | $8,960 | $30,700 |
| AS | $8,960 | $27,600 |
| BB | $8,874 | $23,800 |
| Y | $8,835 | $34,100 |
| AO | $8,440 | $29,100 |
| K | $8,400 | $29,500 |
| AK | $8,370 | $30,600 |
| F | $8,290 | $37,400 |
| AP | $7,730 | $29,000 |
| AG | $7,700 | $32,000 |
| U | $7,600 | $36,700 |
| AL | $7,560 | $29,600 |
| AV | $7,560 | $26,500 |
| I | $7,350 | $33,300 |
| W | $7,350 | $35,500 |
| J | $7,265 | $29,900 |
| AM | $7,240 | $29,500 |
| G | $7,184 | $33,900 |
| AT | $7,000 | $26,900 |
| AZ | $6,920 | $24,900 |
| AE | $6,750 | $32,200 |
| AH | $6,750 | $30,900 |
| AW | $6,450 | $25,500 |
| AQ | $6,410 | $28,500 |
| AD | $6,400 | $32,200 |
| AY | $6,386 | $25,100 |
| AI | $6,335 | $30,800 |
| BD | $6,180 | $21,400 |
| AU | $6,170 | $26,600 |
| AX | $6,100 | $25,100 |
| H | $6,045 | $33,400 |
| AN | $6,020 | $29,400 |
| L | $6,010 | $28,300 |
| BA | $5,850 | $24,700 |
| AF | $5,400 | $32,000 |
| AR | $5,400 | $28,000 |
| BC | $5,168 | $21,600 |
| X | $3,736 | $35,100 |

Unlike Table 1, Table 2 shows that at least a partial explanation of the level of a school's average faculty salary must take into account the amount of tuition and fees charged to its undergraduates. This seems to make sense: increasing levels of revenue often make it possible to increase levels of expenditure. Faced with increases in cost, an economic organization frequently increases the price of its product.

There is not a perfect correlation between tuition and fees and average faculty salaries. (The value of Pearson's correlation coefficient for this group of schools is .75; thus the proportion of variation in average faculty salaries among these schools explained by differences in tuition and fees is .55) Note that school S charges over $12,000 in undergraduate tuition and fees, and yet has an average faculty salary less than school Q, which charges under $10,000 in undergraduate tuition and fees. Or, consider that the school with the lowest undergraduate tuition and fees (school X) has an average faculty salary of over $35,000, and that the school with the highest average faculty salary (school A) does not charge the highest undergraduate tuition and fees. These anomalies indicate that there is more to the explanation of average faculty salary levels than undergraduate tuition and fee levels.

What other variables might help to explain the variation in average faculty salaries paid at a group of colleges and universities. It is important to remember that the average faculty salary associated with a college or university is a measure of the level of one category of institutional expenditure. Given this, in order to evaluate the level of this expenditure, it is necessary to include information about institutional revenues and about other categories of expenditure.

To refine the explanatory power of the model, it helps to have a list of the kinds of variables that may influence faculty salary levels. Since my purpose is to describe a method for evaluating institutional efforts to compensate its faculty as a body by taking into consideration data on relevant institutional characteristics, certain variables which play a role in the decision to compensate an individual member of the faculty will be ignored. These variables include merit and evaluation of performance. The kinds of variables I wish to consider are those which effect the economic behavior of the institution as a whole. The following is a list of such variables:

Tuition and fees revenue
Benefits as a % of salary
Number of faculty employed
Number employed at each rank
Number employed in each discipline
Enrollment
Institutional mission
Number of programs offered
Institutional control
Amount and sources of sources of operating revenue
Institutional aid expenditures
Other categories of expenditures

Since the assumptions of the model are that there are a number of variables which effect average faculty salary (level of other expenditures, amount of tuition and other types of revenue), the analysis of average faculty salary data using a univariate statistical method such as rank ordering is bound to be incomplete, unless the institutions included in the comparison group all have similar levels of expenditure (by category) and revenue (by category).

It would be impractical to collect data about levels of revenue and expenditures for all categories. More importantly, for a given group of institutions, not all categories of revenue and expenditure are well-correlated with average faculty salary. For example, for a group of institutions with small endowments, the revenue from endowment income has little effect on the average salary paid to faculty (at least when compared to a revenue source such as tuition and fees.) Thus, the method of analysis presented here begins with an analysis of the (linear) correlation between average faculty salaries and the values of some set of variables from the above list.

The purpose of this correlation analysis is to identify some subset of the variables described by the model as predictor variables of the average faculty salaries at the institutions in the group. These are variables for which data has been collected and which have what the researcher judges to be a high degree of correlation with average faculty salary. For example, in the analysis presented below, data on undergraduate tuition charges, undergraduate enrollment and average faculty salaries were tested using multiple regression analysis. For the group of schools analyzed, 76% of the variation in average faculty salaries was explained by the tuition and fees charged to undergraduates and the enrollment of full-time undergraduates.

Conceptually, then, the purpose of determining the degree of statistical correlation between average faculty salaries and other variables is to incorporate not only information provided by the model of factors that effect average faculty salaries, but empirical information about the relative weights of those factors on observed average faculty salaries among a specific group of institutions.

By using a multivariate statistical method, one can account for differences in levels of expenditure (by category) and revenue (by category). In the method discussed below, multiple regression analysis is used to calculate an *estimated* average faculty salary for every institution in the comparison group. The meaning of the estimated average faculty salary for a particular institution is that if the "average" institution of this group had exactly the levels of revenue and expenditure that characterize the local institution, then the average faculty salary at that institution would be the estimated average faculty salary. The difference between the average faculty salary of an institution and the estimated average faculty salary associated with it by the regression formula, called the residual, is the measure for evaluating institutional efforts to compensate faculty. If the residual is positive, then the institution is exceeding the average efforts of the group; if the residual is negative, then the institution is compensating its faculty at an average rate which is lower than the rates

associated (by the regression formula) with an institution which had identical levels of revenue and expenditure.

Table 3 shows the results of this analysis for tuition, enrollment and average faculty salary data from the schools included in Tables 1 and 2.

Table 3: Ranking by residual ( Actual - Estimated )

| | Average Faculty salary | | |
|---|---|---|---|
| | Actual | Estimated | Residual |
| X | $35,100 | $27,086 | $8,014 |
| A | $53,500 | $46,119 | $7,381 |
| AF | $32,000 | $24,977 | $7,023 |
| M | $46,300 | $40,520 | $5,780 |
| N | $42,200 | $36,706 | $5,494 |
| Q | $38,600 | $33,455 | $5,145 |
| AE | $32,200 | $27,662 | $4,538 |
| AI | $30,800 | $27,077 | $3,723 |
| F | $37,400 | $34,092 | $3,308 |
| **AN | $29,400 | $26,917 | $2,483 |
| **AD | $32,200 | $29,823 | $2,377 |
| **H | $33,400 | $31,354 | $2,046 |
| **E | $40,000 | $38,247 | $1,753 |
| **AG | $32,000 | $30,652 | $1,348 |
| **V | $35,800 | $34,521 | $1,279 |
| **AM | $29,500 | $28,367 | $1,133 |
| **G | $33,900 | $32,789 | $1,111 |
| **B | $48,600 | $47,608 | $992 |
| **Y | $34,100 | $33,138 | $962 |
| **W | $35,500 | $34,902 | $599 |
| **AK | $30,600 | $30,128 | $472 |
| **AR | $28,000 | $27,588 | $412 |
| **AQ | $28,500 | $28,135 | $366 |
| **AB | $33,200 | $32,906 | $294 |
| **AL | $29,600 | $29,685 | $-85 |
| **AH | $30,900 | $31,102 | $-202 |
| **Z | $33,700 | $33,936 | $-236 |
| **U | $36,700 | $37,282 | $-582 |
| **O | $40,000 | $40,858 | $-858 |
| **L | $28,300 | $29,197 | $-897 |
| **AU | $26,600 | $27,523 | $-923 |
| **AP | $29,000 | $30,056 | $-1,056 |
| **AW | $25,500 | $26,584 | $-1,084 |
| **AJ | $30,700 | $31,807 | $-1,107 |
| **K | $29,500 | $30,611 | $-1,111 |
| **AA | $33,300 | $34,445 | $-1,145 |
| **P | $39,000 | $40,184 | $-1,184 |
| **J | $29,900 | $31,159 | $-1,259 |
| **AC | $32,800 | $34,257 | $-1,457 |
| **T | $36,900 | $38,382 | $-1,482 |
| **BA | $24,700 | $26,464 | $-1,764 |
| **AX | $25,100 | $27,251 | $-2,151 |
| **C | $42,000 | $44,254 | $-2,254 |
| **AY | $25,100 | $27,435 | $-2,335 |
| **AV | $26,500 | $29,196 | $-2,696 |
| **AO | $29,100 | $31,942 | $-2,842 |
| **AT | $26,900 | $29,752 | $-2,852 |
| **R | $37,500 | $40,439 | $-2,939 |
| **BC | $21,600 | $24,642 | $-3,042 |
| AS | $27,600 | $30,945 | $-3,345 |
| S | $36,900 | $40,337 | $-3,437 |
| AZ | $24,900 | $28,374 | $-3,474 |
| I | $33,300 | $36,840 | $-3,540 |
| BD | $21,400 | $25,707 | $-4,307 |
| D | $40,600 | $46,003 | $-5,403 |
| BB | $23,800 | $30,118 | $-6,318 |

(** within St error of estimate)

A regression analysis was run on these data. The dependent variable was average faculty salary; the independent variables were full-time undergraduate tuition and fees and full-time undergraduate enrollment. As mentioned above, the adjusted $R^2$ value (percent of variation in average faculty salaries "explained" by the independent variables) was .76. The resulting regression equation was then applied to the values of the dependent variables (enrollment and tuition) to calculate an *estimated average faculty salary*. The meaning of this estimate is that, given the data, the regression equation calculates an average faculty salary of the "average" school in the sample, given data on enrollment and tuition and fees. For example, if a school in this group had tuition and fees of $5,000 and a full-time undergraduate student body of 1,500, the school would probably have an average faculty salary of $26,756, plus or minus $3,200.

Table 3 provides a very different perspective on faculty salaries paid at the colleges and universities in the sample. For example, where school D is ranked #6 in Table 1, it is 55th. out of 56 in Table 3. While it has a comparatively high average faculty salary, given its tuition and enrollment levels, school D is paying its faculty significantly *less* than the typical institution in this sample. (Note that while this school falls significantly in the ranking for Table 2, this discrepancy between its apparent ability and its actual performance is not revealed by the ranking displayed in Table 2.) On the other hand, while schools AF, AE and AI all fall in about the middle of Table 1, all three are exceeding their apparent ability (as measured by the regression equation) to compensate their faculty. (Again, this is not brought out by the ranking of Table 2.)

In addition to providing an explanation of the variation in average faculty salaries in the sample, the regression analysis can be used to answer policy questions. For example, if enrollment levels at these schools remain constant, what increase in tuition would be expected if the average faculty salaries increased, on average, 5%? For this group of schools, tuitions would have to be increased 6% to achieve an average 5% increase in faculty salaries. To the extent that this group of schools is representative of private sector higher education, this would help to explain why tuition increases at a rate greater than the consumer price index.

In conclusion, while this method of analysis is more complex than the simple rank ordering of faculty salaries, it is a powerful analytical tool. It enables the researcher to measure the relevance of a variety of data (using the coefficient of correlation) to the variance in average faculty salaries. It allows the researcher to incorporate only those variables that meet some explicit criterion of relevance. Finally, since it is a multivariate technique, it has far greater explanatory power than the rank ordering of a set of schools by their average faculty salaries.

# STUDENT INTENTION AND RETENTION IN A COMMUNITY COLLEGE SETTING

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## Background

The majority of theory and research regarding student retention has sought to uncover the reasons why a student does or does not remain in a particular institution and eventually earn a degree. The four year college or university has been the usual setting for this research. Factors such as sex, race, program of study, previous academic success, and SAT scores have been examined for possible causal links to retention.

Implicit in these studies is this assumption: all college students consider the achievement of a degree one of their major goals. If they don't intend to get one from their current institution, then they intend to transfer and get one from another institution. The purpose of measuring retention, then, is to see how well a particular institution is able to hold onto its students. When a student neither graduates nor transfers a failure has occurred on either the part of the student or the institution.

Community college personnel are well aware that their students do not measure up to the 'traditional' student profile. One-year retention of students at public 2 year colleges averages only 55%! (Beal and Noel, 1980) Under the four-year paradigm, then, it would be easy to conclude that either the 2-year colleges or their students are failing.

But do all college students really want to earn a degree? Certainly there are a wide variety of reasons for enrolling in higher education. Students have goals which can include intellectual, career, personal development, or family related elements, to mention a few. Some of these goals require the attainment of a degree, some do not. The broad educational missions, open admissions policies, and low tuitions of most community colleges make them the ideal institution for students with non-traditional goals. If we could learn why students are enrolling in community colleges, then we could better measure their degree of success.

## Data Collection

In the Fall of 1988, Brookdale Community College began to administer an Entering Student Survey. The purpose of the project was to gather information about students' goals, expectations, and situations at the time of their initial enrollment. Questions for the survey were developed by a committee which represented various parts of the campus. The instrument consisted of the following 5 sections:

Part 1 — 15 multiple choice items regarding students' current situations and their short and long term plans for education.

Part 2 — 26 different goals are rated as being a 'major reason,' 'minor reason,' or 'not a reason' for attending Brookdale.

Part 3 — Students indicate whether or not they would like to participate in 11 types of student activities.

Part 4 — 33 factors are rated as being 'very important,' 'moderately important,' 'slightly important,' or 'not important' in choosing Brookdale over other educational alternatives.

Part 5 — 4 pieces of demographic information are collected.

Of the 3,590 students new to Brookdale in Fall 1988, 2,719 completed our survey. Some surveys could not be used since the student never actually registered, essential information was missing, or for other reasons. Removing these surveys left a total of 2243, or 62% of the entering students.

## Student Intention

Survey items which will be used in this analysis come from sections 1 and 2 of the instrument. Upon examination, many of the 26 items from Part 2 were found to be either confusing to students or too vague for use in this analysis. For example, the item 'To earn a college degree' is vague in that it does not specify whether the student wishes to earn an Associate's, Bachelor's, or both degrees. Some students found some of the long items confusing, responding with 'major reason' to both 'To obtain my Associate Degree and then transfer to another college' and to 'To take a few courses and then transfer to another college.'

In order to overcome these difficulties and make as much use as possible of the items in Part 2, a typology was developed using some of the items. According to students' 'major

reason' responses only, students were placed into one of three goal categories: transfer, career, or personal interest. 'Minor reason' responses were not used. The following items were used to create the typology:

| Type | Item(s) with Major Reason Response |
|---|---|
| Transfer | To earn my Associate Degree and transfer to another college |
| | To take a few courses and then transfer to another college |
| Career | To increase my earning power |
| | To obtain my Associate Degree and then obtain appropriate employment |
| | To take a few job related courses |
| | To take a few courses and then get an appropriate job |
| | To prepare for a new career |
| Personal Interest | To study new and different subjects |
| | To take some courses for my own interest |

The items used to create the typology were chosen on the basis of content and internal consistency of student responses with other survey items (generally Part 1 items.) Priority was given to the transfer category, then the career category, and finally the personal interest category. Therefore if a student gave a response of 'major reason' to the items 'To take a few courses for personal interest and then transfer to another college' and to 'To take some courses for my own interest,' then the student was categorized as a transfer student. In order to be placed in the personal interest category, the student must have responded with 'major reason' to one of the personal interest items but not to any of the transfer or career items.

According this typology, the 2243 students in our sample were categorized as follows:

| | | |
|---|---|---|
| Transfer | 1121 | 51.7% |
| Career | 820 | 37.8% |
| Personal Interest | 227 | 10.5% |
| (unclassified) | 75 | |

One of the items from Part 1 of the survey pertains to students graduation plans. The responses to this item are as follows:

Do you plan to graduate from Brookdale?

| | | |
|---|---|---|
| Yes | 994 | 44.8% |

| | | |
|---|---|---|
| No | 687 | 31.0% |
| Undecided | 538 | 24.2% |
| (missing) | 24 | |

We can see from these responses that Brookdale students do indeed have a variety of educational goals. While 52% are interested in transferring and 38% in pursuing a career, only 45% of entering students are planning on getting a degree from Brookdale. Table 1 explores the relationship between student intent and plans for graduation.

Table 1

| | Transfer | Career | Personal Interest |
|---|---|---|---|
| Do you plan to graduate from Brookdale? | | | |
| Yes | 561<br>50% | 403<br>50% | 19<br>9% |
| No | 306<br>27% | 206<br>25% | 133<br>59% |
| Undecided | 248<br>22% | 203<br>25% | 72<br>32% |

From Table 1 we see that there are differences in the degree earning plans of the three intention groups. Transfer and career students are similar in their plans to graduate from Brookdale - 50% intend to graduate, roughly 25% do not, and roughly 25% are undecided. On the other hand, 9% of personal interest students intend to graduate, 59% do not, and 32% are undecided. These differences are statistically significant at $p<0.0000$ ($X^2=156.3$, d.f.=4).

Student Retention

Having established that entering Brookdale students have a variety of goals and plans, we can use this information to test the hypothesis that student intention at the time of entry has an effect on future enrollments. For this analysis enrollment data for five semesters beyond Fall 1988 was taken from the Colleges student database. The semesters available for analysis are Spring 1989, Summer 1989, Fall 1989, Spring 1990, and Summer 1990.

Community college students often do not exhibit traditional enrollment patterns. Sometimes they enroll continuously,

sometimes they 'stop-out' and 'stop-in' for various lengths of time. Therefore, rather than compare enrollment in any particular semester, it would be more useful to compare the overall number of semesters beyond the first in which a student enrolled. A retention tally was developed from the above enrollment data by assigning a score of 1 for each semester of attendance, regardless of whether the student enrolled full-time, part-time, etc. Thus for this analysis the retention tally will range from zero to five semesters.

The outcome of this tally is as follows:

| | | |
|---|---|---|
| 0 semesters | 734 | 33% |
| 1 semester | 474 | 21% |
| 2 semesters | 285 | 13% |
| 3 semesters | 345 | 15% |
| 4 semesters | 261 | 12% |
| 5 semesters | 144 | 6% |

The mean number of subsequent semesters attended is 1.7, the median is 1.0, and the mode is 0. A graph of this frequency distribution appears in Figure 1. The distribution is clearly not normal, a fact which affects the types of statistics used in this analysis.

When the retention tallies are broken down by the goal and graduation variables the following tables result.

Table 3 - Retention by Goal Type

| Retention: | Transfer | Career | Personal Interest |
|---|---|---|---|
| 0 semesters | 235<br>21% | 348<br>42% | 112<br>49% |
| 1 semester | 214<br>19% | 177<br>22% | 66<br>29% |
| 2 semesters | 168<br>15% | 92<br>11% | 17<br>8% |
| 3 semesters | 227<br>20% | 92<br>11% | 21<br>9% |
| 4 semesters | 171<br>15% | 78<br>10% | 7<br>3% |
| 5 semesters | 106<br>10% | 33<br>4% | 4<br>2% |

Figure 1

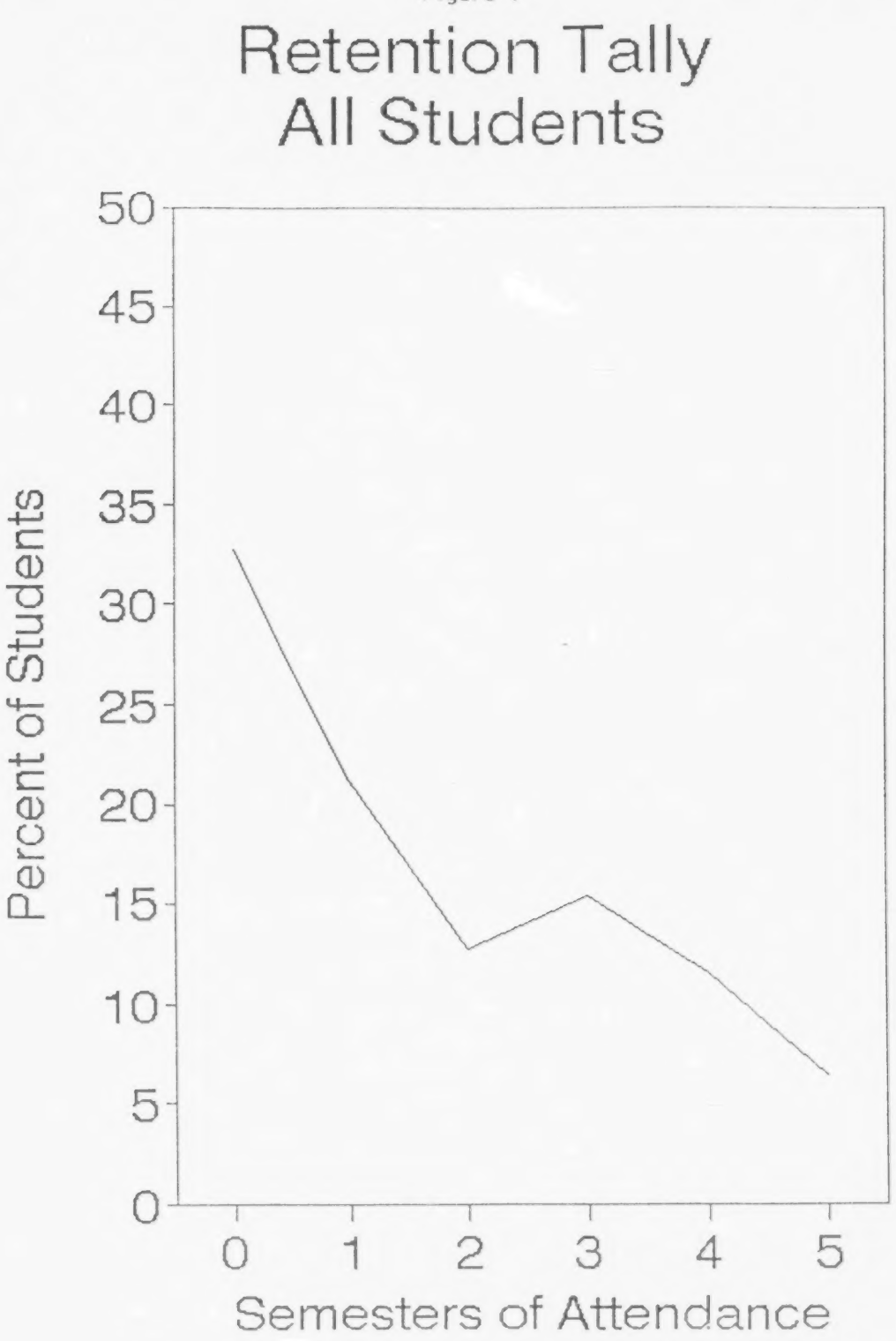

Retention Tally
All Students
Percent of Students
50
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
Semesters of Attendance

Figure 2

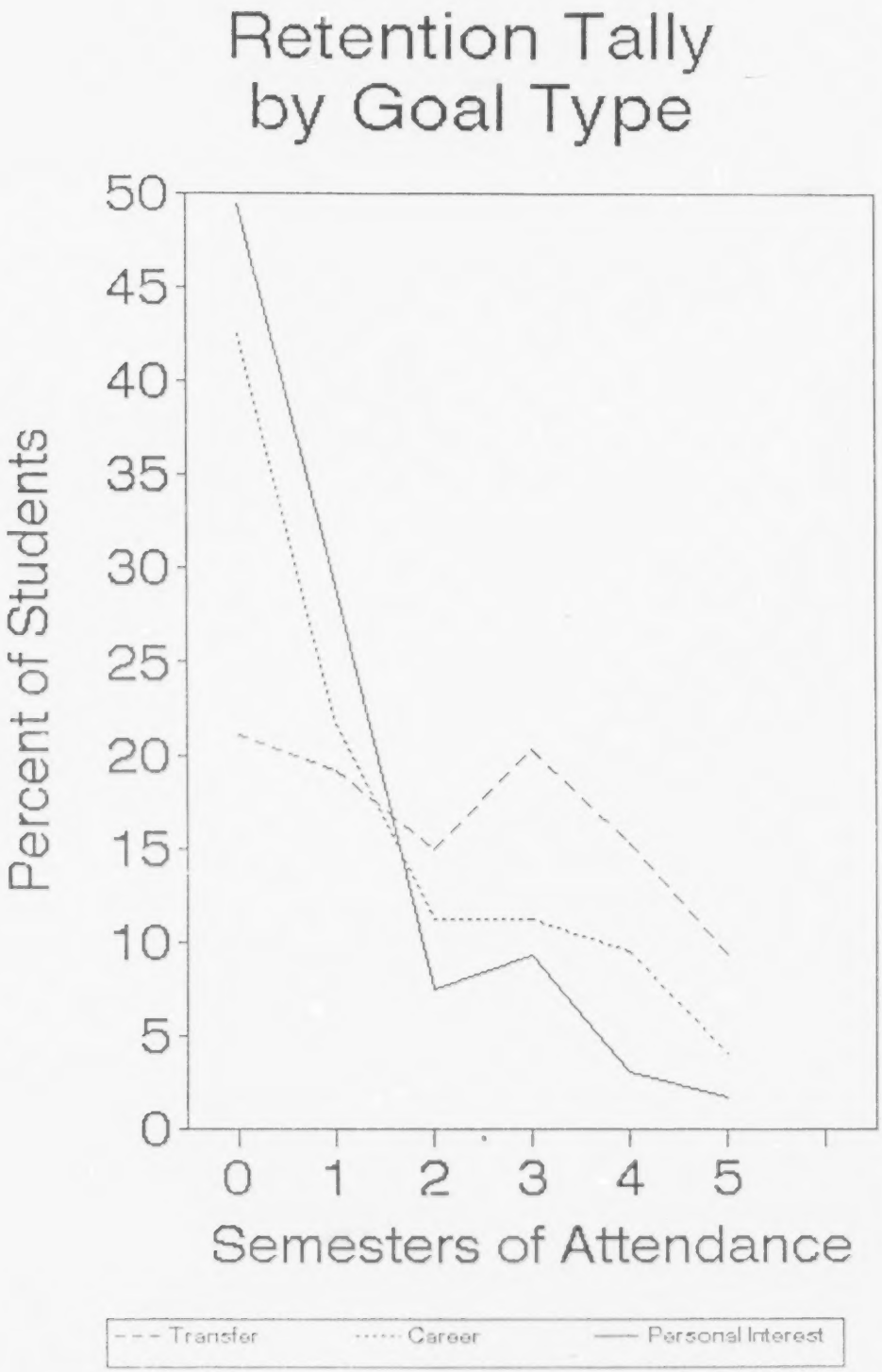

Retention Tally
by Goal Type
Percent of Students
50
45
40
35
30
25
20
15
10
5
0
0 1 2 3 4 5
Semesters of Attendance
Transfer
Career
Personal Interest

Figure 2 graphs the differences in these distributions. The transfer students produce a jagged line, with the number of students returning for 3 semesters almost as large as the number not returning. Career students produce a more curved line, with the largest group of students not returning at all and the number of students returning decreasing as the number of semesters increases. Personal interest students produce a pattern similar to the career students, but more extreme. The differences in this table are significant at the $p<0.0000$ level ($X^2=202.7$, d.f.=10.)

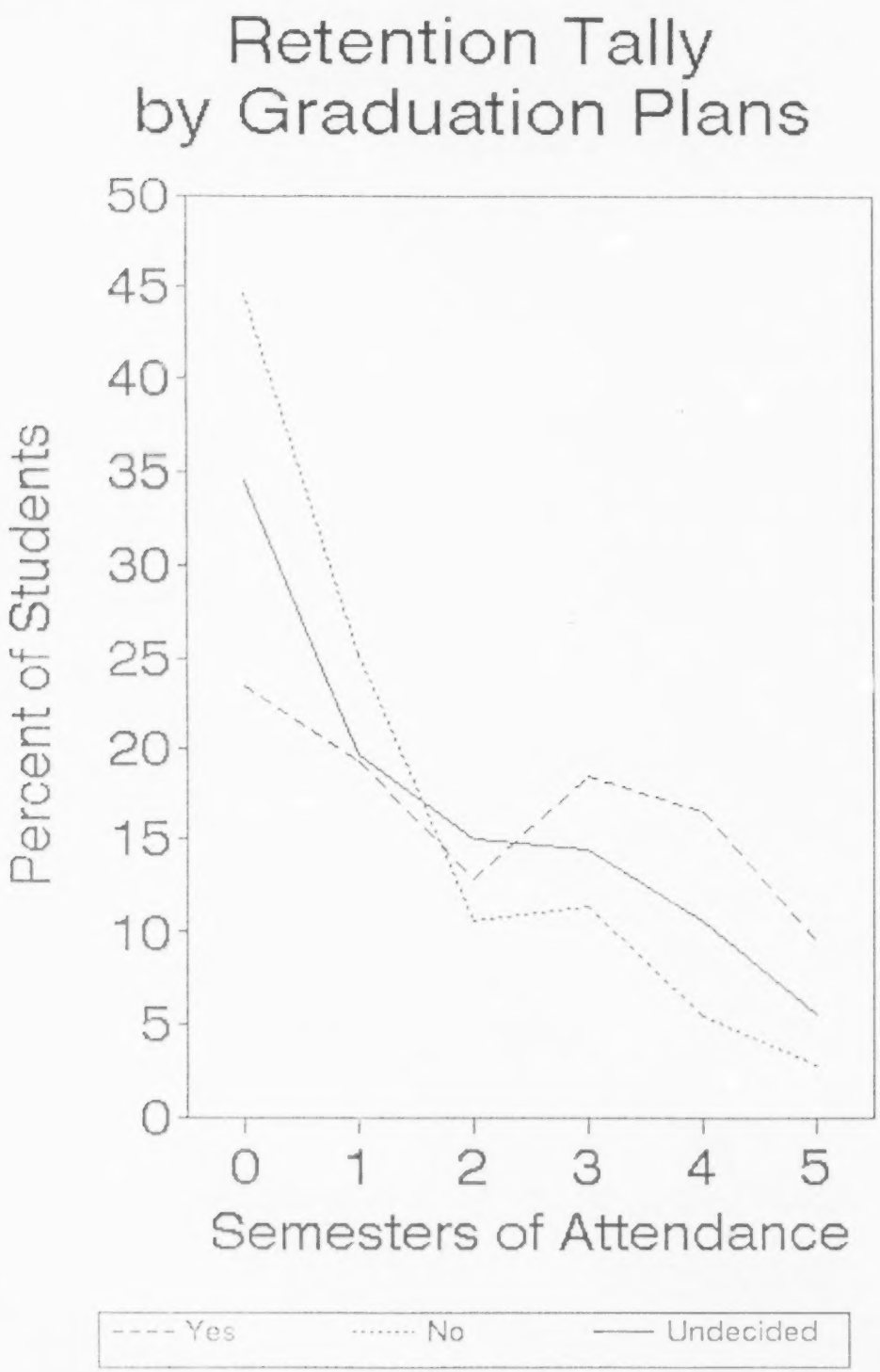
Table 4 - Retention by Graduation Plan

| Retention: | Yes | No | Undecided |
|---|---|---|---|
| 0 semesters | 232<br>23% | 307<br>45% | 186<br>35% |
| 1 semester | 191<br>19% | 173<br>25% | 106<br>20% |
| 2 semesters | 128<br>13% | 73<br>11% | 81<br>15% |
| 3 semesters | 184<br>19% | 78<br>11% | 78<br>15% |
| 4 semesters | 164<br>17% | 37<br>5% | 57<br>11% |
| 5 semesters | 95<br>10% | 19<br>3% | 30<br>6% |

The differences in these distributions are similar to those found in the previous breakdown, as graphed in Figure 3. Students who plan to graduate produce a jagged line with an slight overall slope down to the right. The undecided students produce a rough curve, with the number of students dropping off as the amount of enrollment increases. Those students who do not intend to graduate exhibit a dramatic curve, roughly exponential in shape. Again, the differences in Table 4 are significant at the $p<0.0000$ level ($X^2= 157.2$, d.f.=10.)

In order to further test the effect of student goal type and graduation plans on retention, the Kruskal-Wallis Analysis of Variance was performed. This is a non-parametric test which ranks all cases in the sample according to their value for the dependent variable, assigning each case an integer rank. The subgroups are then separated, and the average rank for each group is computed. If the null hypothesis is true the sub-

Figure 3


Retention Tally
by Graduation Plans
Percent of Students
50
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
Semesters of Attendance
Yes
No
Undecided

groups will have equal average ranks. The statistic used in the test, H, has approximately a $X^2$ distribution. The results of these tests, given below, demonstrate that there does appear to be a relationship between student intent and retention.

| Graduation Plans | Mean Rank | |
|---|---|---|
| Yes | 1272.76 | |
| No | 897.38 | |
| Undecided | 1080.80 | |
| Cases: 2219 | H: 148.6 | p: 0.0000 |

| Goal Type | Mean Rank | |
|---|---|---|
| Transfer | 1254.46 | |
| Career | 936.32 | |
| Personal Interest | 780.47 | |
| Cases: 2168 | H: 182.1 | p: 0.0000 |

## Discussion

This analysis has confirmed what community college researchers have known all along - that our students have in mind a wide variety of goals and that these goals significantly affect their retention. This fact has serious implications for the validity of the traditional four-year retention model when applied to community college students. Simply stated, that model just doesn't work with community college students, their success must be measured in light of their individual goals and intentions.

The exact relationship between student intention and retention has yet to be determined. To fully develop a model for measuring student retention which allows for variation in students' intentions, more variables will have to be taken into account. Prime among these is a measure of whether students eventually achieve their educational goals, since the attainment of an Associate's Degree can no longer be regarded as a valid measure for all students.

As an attempt to begin to collect this data, Brookdale Community College has devised two follow-up surveys to our Entering Student Survey. These surveys will help us follow students' goals as they change over the course of their education, and determine whether students who do stop or drop out have attained their goals. We hope to use the results of these surveys to shed light on some of the many questions left unanswered by this study.

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# PATTERNS AND PREDICTORS OF PERSISTENCE IN UNDERGRADUATE MAJORS

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## Introduction

The initial selection of an academic major and the subsequent decision whether or not to persist in that major are significant events in the life of every college student. These decisions influence students' intellectual development and have potentially profound implications on their future academic and career opportunities.

Social science theorists offer a conceptual framework for understanding the major choice and persistence process. Holland (1973) proposes one key principle: the congruence between one's personal interests or personality and the environment or attributes of a major field. In his theory of careers, Holland outlines six broad categories of interests and work environments: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. He suggests that satisfaction with, and stability of, major field depend on a congruence between one's personality and the special attributes of a major field.

A second key principle to understanding persistence in majors relates to the fact that a student's introduction to a major field may also involve an introduction to a more competitive academic environment. Feldman and Newcomb (1969) propose that the college student is in competition with a reference group more select than any previously known, a condition likely to lead to the reevaluation of one's academic potential.

Previous research reveals one notable trend with regard to major persistence patterns, i.e., the tendency of students to change their academic major during their undergraduate career. Figures reported range from 33 to 75 percent (Astin and Panos, 1969; Feldman and Newcomb, 1969; Krupka and Vener, 1978; Simpson, 1987; and Whiteley, 1987). Based on a study focusing specifically on freshman and sophomore experiences and changes in major field, Theophilides et al. (1984) report that 72 percent of the freshman class at a highly selective residential New York university changed their major one or two times during their freshman or sophomore year. In an earlier article, "Initial Choice of College Major: Are Only the

'Undecided' Undecided?". Robert and Bonnie Titley (1980) report the results of a two-year follow-up study that included 648 entering freshmen who were both behaviorally decided and, by subjective report, "certain" about their major choice. Results revealed that only 468 of this group, representing less than 20 percent of the entire entering freshmen, remained in their initially selected major through the end of two years. Based on the tenuousness of initial major choice reflected in these data, the authors recommend that students should be encouraged to consider an early decision as tentative, a choice to be tested, confirmed, or disconfirmed. These results also provide a useful reference for evaluating the persistence rates presented in this paper.

This paper presents the methodology and results of a longitudinal study designed to enhance the effectiveness of academic advising and curriculum planning by documenting the major choices, the persistence patterns, and factors associated with these persistence patterns during the undergraduate tenure of one entering freshman class at a private New England university.

Given the data available, the study focused on selected student academic characteristics associated with persistence. Results from this research might be viewed as an initial stage in the development of a more complete model for understanding and predicting student persistence in their undergraduate academic major.

This paper, based on a comprehensive report for all undergraduate majors, provides an overview of student persistence rates and department enrollment changes for selected majors in the College of Arts and Sciences and the School of Management.

In addition to the summary persistence data, results from extensive analyses are presented for selected entrance majors. The individual majors chosen for special study represent a range of academic fields: Biology, Chemistry, Mathematics, Computer Science, Economics, Accounting and Marketing. Research on these selected majors addresses the following questions: When do students change their entrance major? What alternative majors do students choose? How do persisters and non-persisters differ in terms of selected admission criteria and undergraduate academic performance?

## Student Major Persistence Profile: Overview

The student persistence profile overview, presented in Table 1, documents the number of students initially enrolled in each entering major. Three persistence rates are presented for graduates - persistence in the entrance major, persistence in another major, and overall persistence at the university.

Table 1

Persistence, Attrition and Change of Major by Undergraduate Entrance Major

| Undergraduate Entrance Major | Total | Persistence | | | Dropouts | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Entrance Major | Other Major | Total | Fresh. | Soph. | Jr. | Sr. | Total |
| Biology | 203 | 59 (29.0) | 100 ( 49.3) | 159 ( 78.3%) | 15 ( 7.4) | 14 ( 6.9) | 3 (1.5) | 12 ( 5.9) | 44 (21.7%) |
| Chemistry | 49 | 13 (26.5) | 26 ( 53.1) | 39 ( 79.6%) | 2 ( 4.1) | 2 ( 4.1) | 4 (8.1) | 2 ( 4.1) | 10 (20.4%) |
| English | 95 | 61 (64.2) | 15 ( 15.8) | 76 ( 80.0%) | 4 ( 4.2) | 6 ( 6.3) | 3 (3.2) | 6 ( 6.3) | 19 (20.0%) |
| Mathematics | 82 | 35 (42.7) | 35 ( 42.7) | 70 ( 85.4%) | 5 ( 6.1) | 4 ( 4.9) | 1 (1.2) | 2 ( 2.4) | 12 (14.6%) |
| Political Science | 151 | 76 (50.3) | 57 ( 37.7) | 133 ( 88.1%) | 7 ( 4.6) | 5 ( 3.3) | 3 (2.0) | 3 ( 2.0) | 18 (11.9%) |
| Computer Science | 34 | 7 (20.6) | 22 ( 64.7) | 29 ( 85.3%) | 2 ( 5.9) | 2 ( 5.9) | 0 (0.0) | 1 ( 2.9) | 5 (14.7%) |
| Economics | 125 | 60 (48.0) | 48 ( 38.4) | 108 ( 86.4%) | 8 ( 6.4) | 4 ( 3.2) | 1 (0.8) | 4 ( 3.2) | 17 (13.6%) |
| Accounting | 83 | 46 (55.4) | 31 ( 37.3) | 77 ( 92.8%) | 3 ( 3.6) | 0 ( 0.0) | 0 (0.0) | 3 ( 3.6) | 6 ( 7.2%) |
| Finance | 86 | 62 (72.1) | 19 ( 22.1) | 81 ( 94.2%) | 0 ( 0.0) | 2 ( 2.3) | 1 (1.2) | 2 ( 2.3) | 5 ( 5.8%) |
| Marketing | 58 | 30 (51.7) | 19 ( 32.8) | 49 ( 84.5%) | 3 (5.2) | 4 ( 6.9) | 0 (0.0) | 2 ( 3.4) | 9 (15.5%) |

*Due to rounding, the sum of the individual percents does not always equal the total percent.

The attrition figures identify the number and percent of students in each entrance major who left the university at the end of each year. The overall persistence profile shows that the university persistence rate for students in each of the entrance majors is consistently quite high. Of those who do leave, most do so at the end of the first or second year.

Frequently reported entrance majors in the College of Arts and Sciences are Biology, Political Science, and English. Persistence rates vary substantially among these popular entrance majors; they range from a relatively low 29 percent in Biology to 50 percent in Political Science and 64 percent in English. In the School of Management, the persistence rates are 72 percent for Finance and 55 and 52 percent respectively for Accounting and Marketing.

## Major Department Enrollment Profile

A complete perspective on the effects of students' changes in major requires an analysis at the departmental as well as at the student level. Therefore, this study identified the net changes between the entrance majors of freshmen and the final majors of graduates. Results reveal that majors with the largest increases include English, Economics, Finance, and Marketing. Reflecting national trends, the two majors with the largest decreases are in the natural sciences - Biology and Chemistry.

The Economics statistics illustrate the value of analyzing both the student persistence rates and the department enrollment trends. Table 1 documents a student persistence rate of 48 percent for the 125 entering Economics majors. However, Table 2 shows that the Economics Department attracted an additional 187 new majors resulting in a total of 247 Economics majors at graduation.

Table 2

Enrollment Changes in Selected Entrance Majors

| Selected Majors | Students in Entrance Major | Graduates in Final Major | Change |
|---|---|---|---|
| Biology | 203 | 74 | -129 |
| Chemistry | 49 | 14 | - 35 |
| English | 95 | 214 | +119 |
| Mathematics | 82 | 62 | - 20 |
| Political Science | 151 | 141 | - 10 |
| Computer Science | 34 | 47 | + 13 |
| Economics | 125 | 247 | +122 |
| Accounting | 83 | 102 | + 19 |
| Finance | 86 | 220 | +134 |
| Marketing | 58 | 161 | +103 |

## Analysis of Persistence in Selected Entrance Majors

This section of the paper presents results from further analyses for selected entrance majors. The analyses focused on when students change their major, the alternative majors chosen, and the characteristics of students who persist and do not persist in their entrance major.

### When Students Change Their Major

The analysis of when students change their major is a potentially useful reference for identifying factors related to change of major. For example, a review of the major courses offered prior to the time of change may suggest a correlation between particular major courses and the peak periods of student withdrawal. Table 3 documents the final semester for non-persisters in each major. These data show that the vast majority of students who change their major do so prior to the third year. Therefore, individual semester information is provided for the first two years and the final semester data are grouped for the third, fourth, and fifth years.

The first year is a critical decision time for students with entrance majors in Mathematics and the Natural Sciences. Approximately 60 percent or more of the students who withdraw from Biology, Chemistry and Mathematics do so by the end of the first year. The pattern of departure is somewhat different with Computer Science, Accounting and Marketing entrance majors: the majority of non-persisting students leave during or after the second year.

Among Economics entrance majors, the time of withdrawal is somewhat more distributed. Of the 48 non-persisting graduates, approximately one-third change their major at the end of the first year and another 54 percent do so by the end of the second year.

### Alternative Choice Final Majors by Entrance Major

Data on persistence rates by entrance majors prompts the question: What alternative majors do the non-persisting students choose? As displayed in Table 4, results show that Economics is clearly a preferred alternative among students who entered with a major in Biology, Chemistry, and Mathematics. Finance is a frequently selected alternative choice major among students who entered with a major in Economics, Computer Science, Accounting and Marketing.

Table 3

Non-Persisters' Final Semester in the Entrance Major

| Year: | First | | Second | | Third | Fourth | Fifth | Total |
|---|---|---|---|---|---|---|---|---|
| Semester: | 1 | 2 | 1 | 2 | | | | |
| Entrance Major | | | | | | | | |
| **Biology** | | | | | | | | |
| Graduates/ Non-Persisters | 9.0% (9) | 52.0% (52) | 16.0% (16) | 12.0% (12) | 10.0% (10) | 1.0% (1) | -- -- | 49.3% (100) |
| Non-Graduates | 13.6% (6) | 50.0% (22) | 11.4% (5) | 18.1% (8) | 4.6% (2) | 2.3% (1) | -- -- | 21.6% (44) |
| **Chemistry** | | | | | | | | |
| Graduates/ Non-Persisters | 11.5% (3) | 50.0% (13) | 19.2% (5) | 11.5% (3) | 7.7% (2) | -- -- | -- -- | 53.1% (26) |
| Non-Graduates | -- -- | 50.0% (5) | 20.0% (2) | 20.0% (2) | 10.0% (1) | -- -- | -- -- | 20.4% (10) |
| **Mathematics** | | | | | | | | |
| Graduates/ Non-Persisters | 5.7% (2) | 62.9% (22) | 22.9% (8) | 8.6% (3) | -- -- | -- -- | -- -- | 42.7% (35) |
| Non-Graduates | 8.3% (1) | 50.0% (6) | 16.7% (2) | 8.3% (1) | 8.3% (1) | -- -- | 8.3% (1) | 14.6% (12) |
| **Computer Science** | | | | | | | | |
| Graduates/ Non-Persisters | -- -- | 31.8% (7) | 9.1% (2) | 50.0% (11) | 9.1% (2) | -- -- | -- -- | 64.7% (22) |
| Non-Graduates | -- -- | 40.0% (2) | 40.0% (2) | 20.0% (1) | -- -- | -- -- | -- -- | 14.7% (5) |
| **Economics** | | | | | | | | |
| Graduates/ Non-Persisters | -- -- | 31.3% (15) | 35.4% (17) | 18.8% (9) | 12.5% (6) | 2.1% (1) | -- -- | 38.4% (48) |
| Non-Graduates | 11.8% (2) | 52.9% (9) | 5.9% (1) | 11.8% (2) | -- -- | 11.8% (2) | 5.9% (1) | 13.6% (17) |
| **Accounting** | | | | | | | | |
| Graduates/ Non-Persisters | -- -- | 12.9% (4) | 12.9% (4) | 51.6% (16) | 19.3% (6) | 3.2% (1) | -- -- | 37.4% (31) |
| Non-Graduates | 16.7% (1) | 33.3% (2) | -- -- | -- -- | -- -- | 33.4% (2) | 16.7% (1) | 7.2% (6) |
| **Marketing** | | | | | | | | |
| Graduates/ Non-Persisters | -- -- | 15.8% (3) | 26.3% (5) | 47.4% (9) | 10.6% (2) | -- -- | -- -- | 32.8% (19) |
| Non-Graduates | -- -- | 33.3% (3) | 33.3% (3) | 11.1% (1) | -- -- | -- -- | 22.2% (2) | 15.5% (9) |

Table 4

Top Alternative Choice Final Majors for Students in Selected Entrance Majors

| Entrance Major | Graduates | Non-Graduates |
|---|---|---|
| Biology | Economics (30)<br>Psychology (24)<br>English (14)<br>(N=100) | Economics (4)<br>Psychology (4)<br>English (3)<br>(N=21) |
| Chemistry | Economics (7)<br>Biology (3)<br>Psychology (3)<br>(N= 26) | Mathematics (2)<br>Physics (2)<br>(N= 6) |
| Mathematics | Economics (15)<br>Communications (9)<br>Finance (5)<br>(N= 35) | Economics (2)<br>English (1)<br>Philosophy (1)<br>(N= 3) |
| Computer Science | Finance (11)<br>Marketing (8)<br>Accounting (2)<br>Economics (2)<br>(N= 22) | --<br>(N= 1) |
| Economics | Finance (15)<br>Psychology (5)<br>Accounting (4)<br>Marketing (4)<br>Communications (4)<br>(N= 48) | Political Science (2)<br>History (1)<br>(N= 4) |
| Accounting | Marketing (14)<br>Finance (13)<br>(N= 31) | Finance (1)<br>(N= 2) |
| Marketing | Finance (11)<br>Accounting (6)<br>(N= 19) | Finance (1)<br>(N= 1) |

Variations in Major Persistence Rates by Gender, Admission Characteristics and Academic Performance

Statistical analysis revealed no significant relationship between gender and persistence, and very few statistically significant relationships between admission characteristics and persistence in the majors selected for further analysis in this study. The admission characteristics examined include Verbal and Mathematical SAT scores, High School Rank, and Admission Rating.

The two most notable exceptions to the overall patterns are the significantly higher Mathematical SAT scores among Biology and Economics entrance major persisters. In Biology, the means are 593, 588 and 543, and in Economics they are 606,

582 and 549, respectively, for graduate persisters, graduate non-persisters and non-graduates.

Statistical analyses relating academic factors to students' change of major revealed a strong relationship between persistence and students' academic performance during their final semester in the entrance major. As shown in Table 5, academic performance is generally highest for graduate persisters, compared with graduate non-persisters and non-graduates. Further, for most of the majors studied, the differences in academic performance between persisters and non-persisters are statistically significant.

In the original study, additional analyses also were conducted examining the relationship between major persistence status and grades in required courses. Results generally revealed the highest grades among graduates who persisted in their entrance major. An illustrative example is the Accounting entrance major. In the required major courses, the average grade earned by graduate persisters is approximately B, compared with C+ to B- among non-persisting graduates, and D+ to C- among non-graduates.

## Summary and Conclusion

The overall major persistence profile presented in this paper reveals two general findings with respect to students and their academic major. First, the majority of students with a declared entrance major change their major before graduation. Second, there is substantial variation, even among popular entrance majors, in student persistence rates and net enrollment changes. Results show a definite pattern with regard to the time students are likely to change their initial major. These time periods suggest that exposure to required major courses may have an impact on students' decision whether or not to persist in their entrance major.

Further analysis reveals an interesting pattern of alternative choice among non-persisting students in certain entrance majors. For example, economics is a popular alternative choice among non-persisting students in the Biology, Chemistry, and Mathematics entrance majors. Finance is a popular alternative choice among non-persisting students in Computer Science, Economics, Accounting and Marketing entrance majors.

Comparative analysis did reveal statistically significant differences among graduate persisters, graduate non-persisters, and non-graduates with respect to the cumulative averages earned during the final semester in the major and grades in selected required courses. In most majors, the cumulative averages achieved during the final semester in the major and the required course grades earned are highest among graduate persisters.

Table 5

Variations in Cumulative Average during Final Semester in the Major by Major Persistence and Graduation Status

| Major | Graduates: Persisters | Graduates: Non-Persisters | Non-Graduates | Total | H Test |
|---|---|---|---|---|---|
| Biology | 3.02 (59) | 2.73 (99) | 2.22 (44) | 2.70 (202) | 37.13*** |
| Chemistry | 3.19 (13) | 2.94 (26) | 2.14 (10) | 2.84 (49) | 12.24** |
| Mathematics | 3.14 (35) | 2.81 (35) | 2.69 (12) | 2.93 (82) | 9.34** |
| Computer Science | 2.82 (7) | 2.77 (22) | 2.54 (5) | 2.74 (34) | 0.22 |
| Economics | 3.05 (60) | 2.79 (48) | 2.63 (17) | 2.90 (125) | 11.15** |
| Accounting | 3.08 (46) | 2.89 (31) | 2.07 (6) | 2.94 (83) | 11.45** |
| Marketing | 2.91 (30) | 2.99 (19) | 2.48 (8) | 2.88 (57) | 2.52 |

* $p < .05$
** $p < .01$
*** $p < .001$

Notes: The following are the grade equivalents for the numerical averages: A 4.00; A- 3.67; B+ 3.33; B 3.00; B- 2.67; C+ 2.33; C 2.00; C- 1.67; D+ 1.33; D 1.00; D- 0.67; and F 0.00.

Given the small numbers in some majors, the nonparametric Kruskal Wallis H test was used to test the statistical significance of the difference among the groups.

A review of previous research as well as experience gained in conducting this research suggest that results from the present study might be viewed as an initial stage in the development of a more complete model for understanding and predicting student persistence in their undergraduate entrance major. Such a model might include personal or career interest information, pre-admission academic information and data documenting students' perception of the quality and career relevance of their undergraduate academic major.

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# FINANCING UNDERGRADUATE EDUCATION: VARIATIONS IN SOURCES AND LEVELS OF DEBT AMONG STUDENT SEGMENTS

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## Introduction

The primary purpose of this paper is to present the method and results of a study designed to document how a recent graduating class at a private New England university financed their undergraduate education.

Specific questions addressed in the research include: To what extent do students rely on loans, scholarships and grants, and family resources in acquiring their college degree? How do major sources of financing and perceived effects of level of indebtedness vary among different student segments?

Results from comparative analyses illustrate whether or not financing methods vary by gender, minority status, and family income level. Given the increasing reliance on loans as a source of financing, special emphasis has been given to the level of indebtedness incurred and the perceived effects of loans on students' personal, educational, and career plans.

The two major sources of data are the Class of 1989 Senior Survey and the university's computerized student-financial aid system file. A response rate of 89% was achieved with the Senior Survey and the computer file provides annual financial aid information for all financial aid recipients over a four year period.

Previous research and policy studies on financing in higher education provide a context for interpreting the results presented in this paper. The College Board (1989), in their report, Trends in Student Aid: 1980 to 1989, identify three major trends that contribute to the critical situation many students and their families currently face in financing a college education. During the past decade, higher education costs have increased much more than personal income or student aid. Federal aid has decreased as a proportion of total aid, and the type of aid offered has shifted from grants to loans. Analyses, based on constant 1988 dollars, show that during the 1980s the cost of attending a private university has increased 56%, while disposable personal income has increased only 16% and student aid has increased only 10.5%. During the same time period, the federal share of available aid has decreased

from 83 to 75%. Institutional aid grew from 12 to 19% of the total with state aid increasing from 5 to 6%.

Hartle (1990), in his discussion on federal support for higher education in the '90s, documents the dramatic nature of the federal policy shift away from grants to loans. He reports that in 1975-1976 grants accounted for 80% of all student aid; this proportion declined to 56% in 1980-1981 and 49% in 1988-1989.

Mortensen (1990) explores the negative implications of this policy shift for poor families. In his recent report, The Impact of Increased Loan Utilization among Low Family Income Students, he documents that participation in higher education has decreased among students from low-income families. Further, among those who are attending, there is a substantial reduction in the number enrolled at universities and an increasing concentration enrolled at two year colleges.

Hansen (1987) in her report, Student Loans: Are They Overburdening a Generation?, claims that growing student indebtedness raises many questions about the implications of debt burdens for the national economy, for the individual well being of borrowers, for equality of access to higher education, and even for the educational process itself. She contends that the evidence is mixed regarding whether or not heavy emphasis on loans discourages traditionally underenrolled groups from participating in higher education, but believes that the burden of loan repayment will be greater for women and minorities because of disparities in income with white males.

The shift to loans away from grants is also believed to have a negative effect on student persistence in college. In "Financial Aid and Educational Outcomes: A Review," Eric Jensen (1983) observes that scholarship and grant aid are generally found to enhance persistence and loans are often related to an increasing probability of withdrawal from college. In more recent studies, Leslie and Brinkman (1988) and Green (1989) confirm this relationship between type of aid and student persistence in college.

The increasing emphasis on loans is believed to affect not only enrollment and persistence but also college graduates' future plans: by postponing their plans to pursue graduate study (Wolfinger et al., 1988); by deterring them from pursuing a career of primary interest (Carnegie Foundation for the Advancement of Teaching, 1986); or by limiting their willingness to enter a career in public service (Newman, 1986).

Negative effects are also projected at the system level. Frank Newman (1986) suggests that heavy loan indebtedness may affect the balance between public and private universities.

He writes: "Presently, a student who borrows money to attend college knows that he or she will end up with a substantially larger debt at a private institution. Do we really want students to select colleges on this basis? Will that, in the long run, preserve the diversity that is so important to the health of the American system of higher education?" (p. 12)

The previous review highlights major issues raised in the national debate on student aid and financing. Increasing costs and student indebtedness are critical concerns for society, for higher education institutions, and for individual families. These factors have potentially significant implications for achieving society's goals to produce an educated labor force and ensure equal opportunity for all citizens; for individual families' goals for financing their children's college education; and for higher education's goals of promoting diversity within the student population. The university's ability to enroll and retain a diverse student population is critically dependent upon managing costs, offering an affordable education to prospective students, and securing appropriate funding sources for student aid.

## Results

Results presented in this section are based on Class of 1989 graduates' responses to the Senior Survey. Respondents were asked to define specific types of Institutional Financial Aid, Parents' Resources, and other Personal Resources as a 'major source,' 'minor source,' or 'not a source' in financing their education. The resources most frequently reported as major sources of financing are presented in Table 1.

Table 1
Major Sources of Financing

| Sources of Financing | All Students |
|---|---|
| Parents' Earnings/Savings/Assets | 76.7% (1459) |
| Student Loans | 37.6% ( 715) |
| Total Financial Aid Package | 27.9% ( 531) |
| Institutional Scholarships/Grants | 25.4% ( 482) |
| Academic Year/Vacation Earnings | 24.2% ( 460) |
| Own Savings/Assets | 19.4% ( 368) |
| Loans Taken by Parents | 19.1% ( 363) |
| Total | (1901) |

As shown, graduates' responses reveal a strong reliance on parents' resources. More than three quarters of the graduates report Parents' Earnings, Savings and Assets and approximately one-fifth report Loans Taken by Parents as major sources for financing their undergraduate education. Three other most frequently reported sources involve institutional financial aid. More than a third report Student Loans and approximately

one-quarter mention Institutional Scholarships and Grants and the Total Financial Aid Package as their major sources of financing. Finally, approximately one-quarter rely on Academic Year and Vacation Earnings as a major source of financing their college education.

Further analyses investigated the degree to which the overall pattern of major financing sources varied among particular student segments, such as minority students, first-generation students, and students from low-income families. Results revealed no differences in financing sources by gender. Both males and females report the strongest reliance on parents' resources. However, compared with non-minority students, minority students rely to a lesser degree on parents' resources and, to a greater degree, on financial aid administered through the institution. Some 63% of minority students, compared with 78% of non-minority students, report Parents' Earnings, Savings and Assets as a major sources of financing their undergraduate education. In contrast, close to one-half of minority students, compared with one-quarter of non-minority students, identify Institutional Scholarships and Grants and the Total Financial Aid Package as major sources for financing their undergraduate education.

Further analyses also show substantial differences in major sources of financing between first generation and non-first generation students. Over 80% of non-first generation students, compared with only 64% of first generation students, cite Parents' Resources as a major source for financing their undergraduate education. Conversely, over 50% of first generation students, compared with only 31% of non-first generation students, report Student Loans as a major source of financing. Compared with other students, a much higher percent of first generation students rely on Institutional Scholarships and Grants, the Total Financial Aid Package and Earnings as major sources of financing.

Similarly, students from low-income families are much more likely than those from upper income families to rely strongly on institutional financial aid, rather than on parents' resources. Only 40% of the students from low income families, compared with 92% of the students from high income families, cite parents' resources as a major source of financing. Conversely, over 60% of students from low income families, compared with less than 10% of students from high income families, report Student Loans, Institutional Scholarships/Grants and the Total Financial Aid Package as major sources of financing.

Variations in Major Sources of Financing by Student Characteristics are presented in Table 2.

Table 2

Variations in Major Sources of Financing by Student Characteristics

| Outcome | Gender | | Minority Status | |
|---|---|---|---|---|
| | Males | Females | Minority | Non-Minority |
| Parents' Earnings/ Savings/Assets | 74.3% (547) | 78.9% (908) | 62.7% ( 74) | 78.1% (1327) |
| Student Loans | 36.1% (266) | 38.7% (446) | 53.4% ( 63) | 37.1% ( 631) |
| Total Financial Aid Package | 28.5% (210) | 27.8% (320) | 50.8% ( 60) | 26.7% ( 454) |
| Institutional Scholarships/Grants | 26.8% (197) | 24.5% (282) | 49.1% ( 58) | 24.0% ( 408) |
| Academic Year/ Vacation Earnings | 24.6% (181) | 23.9% (275) | 21.2% ( 25) | 24.6% ( 418) |
| Own Savings/Assets | 20.9% (154) | 18.4% (212) | 16.9% ( 20) | 19.7% ( 335) |
| Loans Taken by Parents | 17.8% (131) | 20.0% (230) | 17.8% ( 21) | 19.4% ( 330) |
| | 736 | 1151 | 118 | 1700 |

| Outcome | Family Income Level | | | First Generation Status | |
|---|---|---|---|---|---|
| | <$40,000 Low Income | $40,000-$99,000 Medium Income | >$100,000 High Income | Not First Generation | First Generation |
| Parents' Earnings/ Savings/Assets | 46.1% (167) | 81.4% (657) | 92.0% (493) | 81.6% (1111) | 64.4% (348) |
| Student Loans | 72.9% (264) | 45.4% (366) | 6.0% ( 32) | 31.4% (427) | 53.3% (288) |
| Total Financial Aid Package | 62.2% (225) | 31.5% (254) | 3.4% ( 18) | 21.7% (295) | 43.7% (236) |
| Insitutional Scholarships/Grants | 62.2% (225) | 25.4% (205) | 3.7% ( 20) | 18.7% (254) | 42.2% (228) |
| Academic Year/ Vacation Earnings | 39.2% (142) | 28.5% (230) | 8.6% ( 46) | 20.4% (277) | 33.9% (183) |
| Own Savings/Assets | 30.1% (109) | 22.2% (179) | 8.0% ( 43) | 17.5% (238) | 24.1% (130) |
| Loans Taken by Parents | 13.5% ( 49) | 28.1% (227) | 10.8% ( 58) | 19.3% (263) | 18.5% (100) |
| | 362 | 807 | 536 | 1361 | 540 |

## Level and Perceived Effects of Educational Debt

According to Class of 1989 graduates' survey responses, approximately one-quarter of the students borrowed between five and fifteen thousand dollars and another one-fifth borrowed fifteen thousand dollars or more for their college education.

The self-reported level of indebtedness is similar for male and female graduates but does vary somewhat by minority status. Only 23% of minority students, compared with 33% of non-minority students, report zero educational loans. On the upper end of the continuum, 22% of minority students, compared with 18% of non-minority students, report educational loans of $15,000 or more.

Comparative analysis also shows substantial variation in level of indebtedness by family background characteristics, particularly by family income level. Close to one-third of students from low income families, compared with 5% of those from high income families, incurred educational loans equal to or greater than $15,000. Another 45% of students from low income families, compared with 8% of the students from high income families, incurred educational loans between five and fifteen thousand dollars.

Class of 1989 graduates were asked to indicate to what extent their educational loans affected their personal lives and their educational and career plans. Graduates most frequently report that these loans made education affordable. Next in order, close to a third of the respondents report that educational loans, to a great extent, necessitated immediate employment and caused anxiety about finances. Approximately one-fifth of the students indicate that educational loans had a strong effect on their decision to postpone graduate school.

As shown in Table 3, the perceived effects of educational loans are greater for females compared with males and, as expected, for students from low income families compared with those from high-income families.

Approximately a third of female students, compared with close to one-quarter of male students, report that educational loans to a great extent necessitated immediate employment and caused anxiety about finances. Similarly, 20% of female graduates, compared with only 14% of male graduates, report that educational loans, to a great extent, caused them to postpone graduate school. With regard to income, over 70% of students from low income families, compared with 13% of students from high income families, report that educational loans made education affordable. Similarly, over 40% of students from low income families, compared with 11% of students from high income families, report that educational

Table 3

Outcomes Affected to a Great Extent by Educational Loans

| Outcome | Gender | | Minority Status | |
|---|---|---|---|---|
| | Males | Females | Minority | Non-Minority |
| Made Education Affordable | 50.6% (195) | 54.7% (335) | 61.8% ( 42) | 52.3% (471) |
| Necessitated Immediate Employment | 27.0% (104) | 36.9% (226) | 36.8% ( 25) | 32.8% (295) |
| Caused Anxiety About Finances | 24.2% ( 93) | 31.9% (195) | 39.7% ( 27) | 27.7% (249) |
| Reduced Amount Have to Earn | 24.9% ( 96) | 23.2% (142) | 38.2% ( 26) | 22.4% (202) |
| Postpone Major Purchase | 21.6% ( 83) | 21.6% (132) | 29.4% ( 20) | 21.1% (190) |
| Postponed Graduate School | 13.8% ( 53) | 20.3% (124) | 22.1% ( 15) | 17.2% (155) |
| | 385 | 612 | 68 | 900 |

| Outcome | Family Income Level | | | First Generation Status | |
|---|---|---|---|---|---|
| | <$40,000 Low Income | $40,000-$99,000 Medium Income | >$100,000 High Income | Not First Generation | First Generation |
| Made Education Affordable | 71.7% (225) | 51.1% (260) | 12.6% ( 13) | 46.6% (296) | 64.2% (237) |
| Necessitated Immediate Employment | 43.3% (136) | 31.2% (159) | 10.7% ( 11) | 30.2% (191) | 37.9% (140) |
| Caused Anxiety About Finances | 40.1% (126) | 26.3% (134) | 10.7% ( 11) | 26.9% (170) | 32.0% (118) |
| Reduced Amount Have to Earn | 31.5% ( 99) | 21.8% (111) | 6.8% ( 7) | 22.6% (143) | 26.6% ( 98) |
| Postpone Major Purchases | 29.6% ( 93) | 19.8% (101) | 5.8% ( 6) | 19.6% (124) | 25.2% ( 93) |
| Postponed Graduate School | 20.4% ( 64) | 17.9% ( 91) | 5.8% ( 6) | 17.6% (111) | 18.4% ( 68) |
| | 314 | 509 | 103 | 632 | 369 |

loans 'necessitated immediate employment' and 'caused anxiety about finances.'

Financial Aid Sources: Student File System

As noted in the introduction, the data presented in the previous section on how students finance their education and on the perceived effects of loans is based solely on self-reported data from the Senior Survey. In an effort to provide an objective as well as subjective basis for assessing the level of various financing sources, the study also included extensive analyses of financial aid data on the university's computerized student file. Highlights from these analyses follow.

Financial aid financing sources were classified in three major categories: Scholarships/Grants, Loans, and Earnings. Variations were examined by selected student characteristics: gender, racial background, first generation status and family income level. The data presented included the total and average dollar amounts and a comparison of the percent of the dollars allocated with the percent of the total population represented by each student subgroup. This comparison provides a basis for determining whether a particular subgroup is receiving a higher or lower share of the dollars relative to its size in the student population.

Results from these analyses reflect the university's policies and responsiveness to meeting the financial needs of minority, low-income and first-generation students. The most noticeable difference between minority and non-minority students occurs with respect to grants and scholarships. The average amount for minority students is approximately $28,000 compared with $15,000 among non-minority students. First-generation students, who represent slightly more than a quarter of the graduating class, receive over 40% of the Earnings and Scholarship/Grant total; over 35% of the Loan total; and over 40% of the Total financial aid dollars monitored or administered by the university.

Clearly, the largest difference in terms of percent of dollars allocated and average awards exists in relation to family income. Students from low income families represent approximately 20% of the graduating class, but they receive 40% of the total financial aid dollars monitored or administered by the university. In contrast, students from high income families represent over 30% of the respondents, but receive less than 10% of the total dollars. Also, the average awards for students from different family income levels are significantly different for each major financing source. The most extreme difference occurs with respect to Scholarships and Grants; the average award for students from low income families is approximately $24,000 compared with $6,700 for students from high income families.

Additional comparative analyses of total and average dollar amounts by students' future plans revealed no statistically significant differences with respect to variations in highest degree expected, academic field of highest degree expected, or long-term career goals. However, longitudinal data would be necessary to determine the actual effect of financial aid on graduates' future educational and career attainment.

Summary and Conclusion

Results presented in this paper reveal that Parents' Resources are a major source of financing for the majority of undergraduate students. However, compared with the overall class, minority students, first generation students, and students from low-income families rely to a much greater degree on institutional financial aid, including scholarships and loans, and to a lesser degree on parents' resources as a means of financing their undergraduate education.

According to the self-reported survey data, approximately one-quarter of the graduates borrowed between five and fifteen thousand dollars and another one-fifth borrowed fifteen thousand dollars or more for their college education. Comparative analysis shows that level of indebtedness varies most by family income level. Close to one-third of the students from low income families, compared with 5% of those from high income families, incurred educational loans equal to or greater than fifteen thousand dollars.

Among the students who took educational loans, approximately one-third report that these loans, to a great extent, caused anxiety about finances and necessitated immediate employment. The perceived negative effects are greater among female students, minority students and students from low income families. Some 40% of students from low income families report that educational loans necessitated immediate employment and caused anxiety about finances.

Analyses of financial aid data on the university's Administrative Computer System file highlight minority, first-generation and low-income students' greater reliance on institutional financial aid as a source for financing their education. Relative to their size in the population, students in these groups receive a higher proportion of the total financial aid, as well as scholarship and grant dollars monitored or administered by the university. Compared with the overall population, minority, first-generation, and low-income students also receive above average scholarship and grant award amounts.

Results presented in this report do suggest cause for concern about the impact of trends in pricing and financial

aid on future minority and low-income students' attendance at a private university. If the costs of higher education continue to increase and loans continue to assume a major role in the financial aid package, many students may be reluctant to incur the debts required to attend a private university. Further, the real and perceived burden of indebtedness can potentially have significant implications for the university's goal to sustain and increase diversity among the student population. The critical question for the institution is whether or not the university will be able to meet the financial needs of future minority, first-generation and low-income students aspiring to attend a private university.

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# EFFECT OF ATHLETIC PARTICIPATION ON UNDERGRADUATE EDUCATION

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## Introduction

The role and impact of athletics in higher education has been the focus of increasing attention in the popular media as well as in professional and academic journals. The nature of this attention ranges from philosophical inquiries regarding the compatibility of major sports activities with the mission of higher education to sensational articles featuring alleged abuses in college athletic activities.

A. Bartlett Giamatti (1989) offers perhaps one of the most eloquent and ideal perspectives on the general topic of the meaning of sports. In his essay, Take Time for Paradise, he portrays sports as an 'instrument of vision,' a symbol of the ideal, and a manifestation of our longing for the condition of freedom associated with paradise. He writes:

> Sports represent a shared vision of how we continue, as individuals, team or community, to experience a happiness or absence of care so intense, so rare and so fleeting that we associate their experience with experience otherwise described as religious or we say the sports experience must be the tattered remnant of an experience which was once described, when first felt, as religious. (pp. 14, 15)

Focusing on the role of sports in American higher education, Donald Chu (1989) claims that sports has answered a need created in our pluralistic society to help fulfill the peculiar mission of American higher education by providing a vehicle for a sense of community, promoting student commitment, helping label its graduates as successful, and by attempting to elevate individuals beyond the limits of mundane realities to show them what they can be. Other national researchers and leaders echo Chu's claim regarding the positive potential for the role of sports in higher education.

Astin's (1985, 1987) national studies document that athletic involvement shows a pattern of effects on students' development closely paralleling those associated with academic involvement. George Hanford (1974), in his writings on intercollegiate athletics, supports the claim that success in athletics has an indirect positive effect on the image of the

university and ultimately on labelling the graduates as successful. He has observed that prominence in sports is equated in the public mind with academic reputation and prestige and that the prestige of athletes may serve to label an institution as a school with which students wish to be associated.

Research by Chu and Solomon (1986) provide empirical evidence in support of Hanford's claim; these authors compared the application rates at NCAA conference champion schools with those at schools that did not win league crowns in either football or basketball. Results showed significant differences. Depending on the conference, the average increase in new applications for this period was at least doubled for conference champions. The increase in the number of applications has potential implications for increase in quality. These schools have a larger pool of applicants from which to select the best qualified students.

While noting the potential positive effects for the institutions, the critical question remains: how to balance athletics and academics in the life of the student-athlete. In a recent article in the New York Times, William Rhoden highlights the challenge associated with this goal. Results reported document that football and basketball players spend an average of 30 hours a week on their sports and about 13.7 in class. Commenting on this reality, David Goslin asserts that "What we are asking kids to do is hold two full-time jobs: school is one, then they've got sports. It has become a tremendous burden." (New York Times, January 7, 1990, pp. 1,25).

How the university and the individual student balance academic obligations with the demands of athletic performance is indeed a critical issue. Giamatti offers an insightful perspective for addressing this issue. He explains that sports is a convention that mediates between the tedium of life and work and a world of special privilege, seemingly of total freedom. However, when one enters into the world of sports to live there, "...sport as mediator dissolves and cult displaces convention" (Giamatti, 1989, p. 56). It is easy for the college athlete to yield to the cultic attraction of the special world of sports, particularly if he or she has no role in the culture of college life except to be a mercenary, and if the pressures of athletic performance are never countered by other expectations or demands. From Giamatti's perspective, many of the abuses associated with professional or collegiate athletics may be attributed to the cultic dimension of sports.

Although the initiatives may not be well known to the public, many higher education institutions have recognized the challenges facing the student-athlete and they have developed support programs to assist student-athletes in meeting these challenges. Figler (1982) surveyed 116 colleges and

universities and found that the majority provided special programs for student-athletes (Gordon, 1986). While the present study was not designed as an evaluation, the initial time period coincides with the establishment of the university's student-athlete support program.

Retention Profile of Student-Athletes and Non-Athletes

In this study, the effects of athletic participation were examined in two phases, first in relation to Retention and second with respect to Academic Performance. The Retention Phase included both bivariate and multivariate analytic procedures. The former provided an overall retention profile and comparative statistics on the relationship between various personal or admission characteristics and retention among student-athletes and non-athletes. These characteristics included Gender, SAT Scores, High School Rank and Admission Rating.

A primary purpose of these bivariate analyses was to determine if the graduation rate varied by athletic participation and if the relationship between selected admission characteristics and graduate rate differed between student-athletes and non-athletes.

The comparative retention profile reveals exceptionally high graduation rates for student-athletes and non-athletes. The graduation rate of student-athletes in non-revenue sports impressively exceeds the norm for all students while the graduation rate for student-athletes in revenue sports compares quite favorably with the overall graduation rate of 85% for non-athletes and all students combined.

Comparative analyses of graduation rates by athletic status and selected student characteristics reveals no statistically significant difference with respect to gender and only a few statistically significant relationships with respect to admission characteristics, i.e., SAT Scores, High School Rank, and the overall Admission Rating.

These statistically significant relationships include higher graduation rates among non-athletes with higher SAT Mathematical Scores and higher graduation rates among students who graduated in the top 20% of their high school graduating class, close to or above 90% for both student athletes and non-athletes. Perhaps the most noteworthy finding from these analyses of graduation rates by admission criteria and athletic status are the very high graduation rates among student-athletes in nearly every rating category. The consistently high graduation rates, particularly among student-athletes with lower Admission ratings, suggest that these student-athletes are benefiting from the academic support of services provided by the University's Learning Resource Program.

Following the bivariate analyses, a multivariate analytic procedure - discriminant analysis - was employed to determine the relative effects of various personal and academic characteristics and athletic participation on retention. The specific variables included as independent variables in the discriminant analysis were Family Income, Type of High School, SAT Scores, High School Rank, Admission Rating, Resident Status, Freshman Cumulative Average and Participation in Athletics.

Results from the discriminant analysis are presented in Table 1.

Table 1

Discriminant Analysis of Retention among Student Athletes and Non-Athletes

| Measures | Standardized Coefficients |
|---|---|
| Freshman GPA | .89 |
| Family Income | .35 |
| SAT Verbal Score | -.22 |
| Athletic Participation (Non-Athlete=1; Varsity Athlete=2) | .18 |
| Resident Status (Commuter=1; Resident=2) | .13 |
| Type of High School (Public=1; Private/Parochial=2) | .12 |

Classification Results

| | N | Centroids | Predicted Group Membership Graduates | Non-Graduates |
|---|---|---|---|---|
| Graduates | 1225 | .13 | 884 (72.2%) | 341 (27.8%) |
| Non-Graduates | 185 | -.89 | 77 (41.6%) | 108 (58.4%) |

Percent of Cases Correctly Classified: 70.35%

Results from Function Test

$Can^R = .32$ $X^2 = 137.79$ $df = 6$ $p \leq .001$

As illustrated in Table 1, the discriminant analysis identifies six variables that account for all of the explained variance. In order of effect size, these variables are: Freshman GPA, Family Income, SAT Verbal Score, Athletic Participation, Resident Status and Type of High School. The standardized coefficients indicate a very strong positive relationship between Freshman GPA and graduation. Positive

though substantially weaker relationships exist between Athletic Participation, Family Income, Resident Status and Type of High School. Students who participate in varsity athletics, with higher family incomes, are resident students, and come from private or parochial high schools are more likely to graduate. Also, as shown, the discriminant analysis results reveal a negative relationship between SAT Verbal Scores and graduation. Understanding this relationship would require further study.

Overall, the model predicts moderately well with 70% of the cases correctly classified. Additional variables would be needed to improve the predictability of the model, particularly for non-graduates.

Effect of Athletic Participation on Academic Performance

Analyses of variance were conducted to examine differences in Annual Cumulative Averages by Athletic Participation, Individual Varsity Sport, and Final Academic Major. In addition, Analyses of Covariance were performed to determine whether or not participation in varsity sports has a statistically significant independent effect on academic performance, after controlling for the effects of selected admission criteria.

Analyses of variance results did reveal statistically significant, though substantively small, differences in the annual cumulative averages of non-athletes, student-athletes in revenue sports and student-athletes in non-revenue sports. Non-athletes earn average grades, close to B, in each of the four years while athletes in non-revenue varsity sports earn yearly cumulative averages between B- and B. Finally, the cumulative averages of athletes in revenue sports are only slightly lower, C+. Further comparison shows that the cumulative averages of athletes in revenue sports remain relatively stable over four years while those of non-athletes and athletes in non-revenue varsity sports increase from the first to the fourth year. These results are quite encouraging particularly for student-athletes in revenue sports which require a tremendous investment of time. The stable average academic performance of these student-athletes reflects a commitment to academics and suggests that students are receiving the support required to meet university academic standards.

Further analyses reveal superior academic performance among student-athletes in specific non-revenue varsity sports. During each of the four years student-athletes in sailing and water polo generally earn the highest cumulative averages, between B and B+. Next in rank order are tennis, soccer, track, volleyball and swimming/diving. The cumulative averages for students in these sports are consistently very close to B.

These comparative analyses also reveal that student-athletes earn their degrees in a variety of academic majors. Several of the top-ranking majors are similar for Non-Athletes, Revenue Sport and Non-Revenue Sport Athletes. For example, Communication Studies, Marketing and Economics rank among the top six majors for the three groups of students. The distribution of frequently chosen majors is quite similar between Non-Athletes and Non-Revenue Sport Athletes. In addition to the majors previously specified, Finance and English are frequently chosen majors by both groups of students.

Analyses of covariance were employed to address the question: Does participation in varsity sports have a significant independent effect on academic performance after controlling for the effects of selected admission criteria? Within a hierarchical regression model, four admission criteria - Admission Rating, SAT Verbal and Mathematical Scores, and High School Rank - were entered first in the regression. The independent variable, Athletic Status, was entered next. This variable classifies students in two categories as Varsity Athletes or Non-Athletes. Four separate regressions were conducted with the annual cumulative averages as the dependent variables in each regression.

As illustrated in Table 2, analyses of covariance results show that, among the covariates, the Admission Rating is consistently the strongest predictor of students' academic performance. Each year, the Rating explains approximately one-quarter of the variance in students' academic performance. In the first and second year, athletic participation has no statistically significant independent effect on academic performance. In the third and fourth years, however, participation in varsity athletics has a small statistically significant independent negative effect. The size of the athletic participation effects may be considered encouraging given the extensive investment of time required of varsity athletes in their third and fourth years. Results from additional regression analyses, with only non-athletes and athletes in non-revenue varsity sports, consistently show that once the admission criteria enter the equation, athletic participation has no statistically significant effect on students' annual cumulative averages from the first through the fourth year. The findings from both sets of regression results suggest that the small negative effect of athletic participation on students' cumulative average is associated with participation in revenue sports.

Table 2

Analysis of Covariance Results Examining the Effect of Athletic Status on Academic Performance Controlling for Selected Admission Characteristics

A. First Year

| Order | Covariates | Bivariate r | Multiple R | R Square | $R^2$ Change | Beta Coef | F Ratio |
|---|---|---|---|---|---|---|---|
| 1 | Rating | .48 | .48 | .23 | .23 | .48 | 542.07*** |
| 2 | SAT Verbal | .28 | .49 | .24 | .01 | .10 | 18.40*** |
| 3 | H.S. Rank | .39 | .49 | .25 | .01 | .11 | 14.54*** |
| 4 | SAT Math | .27 | .50 | .25 | .00 | .05 | 4.89* |
| Independent Variable | | | | | | | |
| 5 | Athl.Status | -.09 | .50 | .25 | .00 | -.01 | .20 |

The F Ratio for the total equation is 118.11 $p \leq .001$.

B. Second Year

| Order | Covariates | Bivariate r | Multiple R | R Square | $R^2$ Change | Beta Coef | F Ratio |
|---|---|---|---|---|---|---|---|
| 1 | Rating | .51 | .51 | .26 | .26 | .51 | 600.67*** |
| 2 | SAT Verbal | .32 | .52 | .27 | .01 | .13 | 32.63*** |
| 3 | H.S. Rank | .43 | .53 | .28 | .01 | .15 | 25.48*** |
| 4 | SAT Math | .32 | .54 | .29 | .01 | .10 | 15.87*** |
| Independent Variable | | | | | | | |
| 5 | Athl.Status | -.10 | .54 | .29 | .00 | -.02 | 1.11 |

The F Ratio for the total equation is 140.46 $p \leq .001$.

C. Third Year

| Order | Covariates | Bivariate r | Multiple R | R Square | $R^2$ Change | Beta Coef | F Ratio |
|---|---|---|---|---|---|---|---|
| 1 | Rating | .51 | .51 | .26 | .26 | .51 | 529.81*** |
| 2 | SAT Verbal | .31 | .52 | .27 | .01 | .13 | 27.77*** |
| 3 | H.S. Rank | .43 | .53 | .28 | .01 | .14 | 19.62*** |
| 4 | SAT Math | .31 | .54 | .29 | .01 | .08 | 8.97** |
| Independent Variable | | | | | | | |
| 5 | Athl.Status | -.13 | .54 | .29 | .00 | -.04 | 3.96* |

The F Ratio for the total equation is 122.23 $p \leq .001$.

D. Fourth Year

| Order | Covariates | Bivariate r | Multiple R | R Square | $R^2$ Change | Beta Coef | F Ratio |
|---|---|---|---|---|---|---|---|
| 1 | Rating | .49 | .49 | .24 | .24 | .49 | 502.42*** |
| 2 | SAT Verbal | .31 | .50 | .25 | .01 | .13 | 32.18*** |
| 3 | H.S. Rank | .41 | .51 | .26 | .01 | .16 | 24.95*** |
| Independent Variable | | | | | | | |
| 4 | Athl.Status | -.13 | .52 | .27 | .01 | -.05 | 5.07* |

The F Ratio for the total equation is 146.01 $p \leq .001$.

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Summary

What do these results mean in the context of the role of athletics in higher education? A thoughtful answer to this question requires assessment and interpretation of both the substantive and statistical significance of these results as well as comparative analyses of these findings with the claims and conclusions presented in popular and academic journals.

In summary, these results provide a real example of student-athletes balancing academic achievement with athletic involvement. The graduation rate and academic performance of student-athletes in revenue sports far exceeds the negative image of student-athletes portrayed in the media. Further, the exceptionally high graduation rate and superior academic performance of many non-revenue student-athletes suggest that athletic involvement may enhance students' commitment both to the institution and to their academic goals.

Results show consistently satisfactory levels of academic performance among student athletes in revenue sports and notably superior levels of academic performance among students in several non-revenue sports: sailing, water polo, tennis and track. The significance of student-athletes' academic performance is enhanced by the knowledge that students attained this level of performance in a range of challenging academic majors. Non-athletes and athletes in varsity non-revenue sports share the same top four ranking majors: Finance, Economics, English and Marketing. The top three majors for athletes in revenue sports are Communication Studies, Marketing and Sociology.

In conclusion, these results validate George Wills' claim that athletic participation need not preclude academic achievement. While recognizing existing problems and abuses associated with college athletics, Will highlights the significant accomplishments of several prominent national universities. Commenting on the positive potential associated with college athletics, Will writes: "Sport is a realm of discipline, skill and excellence, and hence has a legitimate role on campuses. Furthermore, many institutions...are proving that athletic excellence is compatible with academic responsibility" (Newsweek, September 15, 1986, p. 84). Results presented in this research provide further evidence of the positive potential for the effect of athletic involvement on undergraduate education.

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# Assessing an Alumni Reunion Program

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Alumni reunions are the cornerstone of alumni programs; however, Reunion Weekend at Binghamton has not achieved the degree of interest and/or participation from alumni that the Alumni Association desires. For approximately fifteen years, SUNY-Binghamton held sporadic alumni reunions. They were first held in the fall coinciding with Parents' Day, moved to June, and then in 1985 the decision was made to move them to late April while classes were in session. The number of alumni attending each year has varied, and two reunions were cancelled due to inadequate advance registration.

The purpose of this project was to conduct an extensive evaluation of reunions at Binghamton. We did not believe Reunion Weekend had reached its full potential, so we needed to discover whether the shortfall in participation was due to the program itself, a lack of knowledge about the program, unsuccessful promotion, or other causes. The Alumni Association and Alumni and Parent Relations Office operates under a set of beliefs when planning Reunion Weekend. These are based on past experiences, professional or general practices and procedures, or alumni suggestions. Some of these beliefs are the hypotheses which were questioned in this study, some of which are presented in this paper. The way in which institutions approach these issues affects alumni attitudes and the success of reunions. They are not listed in any particular order.

## Hypotheses

1. Personal contact with classmates motivates alumni to attend a reunion.

2. Alumni would prefer academic experiences at reunions rather than social and recreational experiences.

3. Early alumni need to be treated differently from later alumni.

4. Many alumni are first-generation college graduates with no modeling of reunion attendance by parents.

5. Alumni who are active volunteers are more likely to attend a reunion.

6. Couples where both members are graduates of Binghamton are more likely to attend a reunion.

## Methodology

The population for this study was the approximately 34,000 alumni for whom the Office of Alumni and Parent Relations had a current address. From this group we selected 1,000 alumni, roughly stratified by decade of graduation: "The Fifties,"who graduated between 1948 and 1959; "The Sixties," from 1960-1969; "The Seventies," 1970-1979; and "The Eighties," 1980-1988.

The initial survey was sent to 100 alumni, and thirty were returned. After speaking to several respondents and non-respondents and altering the items somewhat, the survey was mailed to the sample in late October. Ten days later a second survey was mailed to the non-respondents. A total of 465 surveys were returned.

Each survey packet contained a cover letter, the questionnaire itself, and a postage-paid reply envelope. The letter was signed by the President of the Alumni Association, a volunteer, in hopes that other alumni would model her behavior and participate in the survey process. In an attempt to personalize the process and perhaps increase participation, each envelope was hand typed rather than computer-labelled.

## Results

The overall response rate was 47 percent; the Sixties had the highest response rate. (Alumni from the Sixties also reported the highest participation rate in college donations, the Volunteer Admissions Program, and alumni newsletter readership.)

Table 1

Response Rate by Decade of Graduation

| | | Respondents | |
|---|---|---|---|
| Decade | Sample | # | % |
| Fifties | 250 | 114 | 46% |
| Sixties | 250 | 135 | 54% |
| Seventies | 250 | 111 | 44% |
| Eighties | 250 | 105 | 42% |
| Total | 1,000 | 465 | 47% |

### Reunion Weekends

Alumni can find out about Reunion Weekend celebrations in a number of ways. In addition to reading about the upcoming event in the alumni newsletter, all alumni receive a brochure in the early spring. Quinquennial celebrants also receive a personalized letter signed by one or more members of their class, and a postcard the summer before.

The most effective predictor of attendance, however, appears to be whether or not the respondent has heard about Reunion Weekend from a classmate. Half of all people who remembered hearing from a classmate have attended a reunion.

Table 2

"How did you learn about Reunion Weekend?"

| Contact Method | Did Attend | Did Not Attend | Total | Yield |
|---|---|---|---|---|
| Phone call from a classmate | 18 | 16 | 34 | 53% |
| Letter from a classmate | 9 | 9 | 18 | 50% |
| Alumni newsletter | 57 | 202 | 259 | 22% |
| Summer postcard | 44 | 175 | 219 | 20% |
| No information received | 6 | 89 | 95 | 6% |

The most reliable predictor of reunion attendance appears to be a form of contact not carried out by the Alumni office--a personal phone call. A personal phone call indicates continued contact with other classmates, presumably on a social level. This is further supported by the levels of interest reported for various activities suggested in the survey.

Table 3

"How interested are you in the following:"

| Activity | Very or somewhat Interested | Very or somewhat Uninterested |
|---|---|---|
| Informal barbecue | 80% | 20% |
| Free time for visiting friends | 78% | 22% |
| Tour of the campus | 67% | 33% |
| Tours of special facilities | 66% | 34% |
| Student performances | 64% | 36% |
| Formal dinner | 48% | 52% |
| Party at a favorite off-campus site | 45% | 55% |
| Buy memorabilia at the bookstore | 44% | 56% |
| Faculty lectures | 37% | 63% |
| Professional conferences | 36% | 64% |
| Staying in a residence hall | 33% | 67% |
| Business-related seminars | 31% | 69% |
| Residential college reception | 31% | 69% |
| School receptions | 26% | 74% |
| Visit to former college site | 24% | 76% |
| Children's program | 23% | 77% |

We were a bit surprised at these results. Students at the university are academically oriented and characteristically very studious. We expected that these traits would carry over into their post-graduate lives, and be reflected in their Reunion Weekend interests. This appears not to be the case.

Some Factors Affecting Attendance

Tradition. As a low-cost alternative to a private university, the student body may be more representative of the state's socioeconomic mainstream. We hypothesized that many of the alumni might be of the first generation of their families to attend college, and that home life therefore would have presented little or no opportunity for modelling attendance at reunions.

This turns out to be true for the earliest graduates, but less true for graduates of succeeding decades. Only seven percent of the Fifties alumni repoerted either of their parents graduating college; 69 percent of the Eighties alumni remember either of their parents graduating college.

Cost. A few studies have shown that an average cost of a three-day reunion is about 200 dollars. The cost of a Reunion Weekend is below this, about 150 dollars, yet is perceived by some as too expensive, and appears to be a factor in attendance. Only ten percent of attenders thought Reunion Weekend was too expensive, while eighteen percent of non-attenders thought so.

Spouse. Where a graduate's spouse attended college, or whether or not he or she attended college at all, was related to Reunion Weekend attendance.

Table 4

From where did your spouse graduate?

| | Ever attended Reunion Weekend? | | | |
|---|---|---|---|---|
| Degree/Institution | Yes | No | Total | Yield |
| No 4-year degree | 26 | 55 | 81 | 32% |
| This university | 22 | 64 | 86 | 26% |
| Public college/university | 13 | 84 | 97 | 20% |
| Private college/university | 15 | 66 | 81 | 19% |
| Not married | 13 | 107 | 120 | 11% |
| Total | 89 | 376 | 465 | 19% |

Interestingly, alumni were most likely to attend if they were married, and their spouses had no 4-year college degree. Perhaps for "two-college" couples there is a degree of competition between the two reunions, whether temporal, financial, or otherwise. This competition might not exist at all where one partner had not received a degree, and to a limited extent if both partners had attended the same school. A partner who had not attended college at all might find the opportunity to "sample college life" inviting.

Volunteerism. Alumni who are active in the Alumni Association are more likely to have attended a Reunion Weekend.

Table 5

Volunteer status and Reunion Weekend attendance

| Degree/Institution | Ever attended Reunion Weekend? Yes | No | Total | Yield |
|---|---|---|---|---|
| Volunteer | 9 | 12 | 21 | 43% |
| Do not volunteer | 80 | 364 | 444 | 18% |
| Total | 89 | 376 | 465 | 19% |

## Conclusions

Pat, the "typical" Reunion Weekend attender, is older and lives relatively near the university. Pat is probably married, and Pat's spouse graduated from this university, if at all. Pat reads the alumni newsletter regularly, and contributes to the annual fund. Neither the cost of Reunion Weekend nor transportation are problems for Pat, who probably stays home and drives in for the interesting activities.

As the university matures, there are fewer Pats graduating. The student body is drawn increasingly from other parts of the state and country. Students stay single longer; and, as a greater percentage of the population attends college, they will be more likely to find partners with four-year degrees. Attendance at Reunion Weekend will go down, and the university will lose touch with its largest constituency--its alumni.

As the governmental well slowly runs dry, there is an increasing need for public institutions to find other sources of revenue. It is imperative that the university bring back more alumni for reunions, and keep their interest after the reunion tent comes down. The strength of an institution is measured not only in dollars, but in the degree to which people are willing to identify with it and share its values.

# Recruitment in the 1990's: An Empirical Investigation of "Message" on the Enrollment Decision Process

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***Abstract:***

**The marketing messages an institution sends to the educational marketplace have varying impact at different stages of the enrollment decision process. It is suggested that by better understanding prospective students during the transition from the inquiry to applicant to enrollment stages an institution can better position itself for marketing effectiveness in an increasingly competitive arena. Results from a two-stage telephone survey of 263 inquiry students suggest that different elements of an institution's image and profile change in terms of importance over time. Similarly, these results show the varying impact specific messages have upon certain market segments at the different stages of the admissions flow process.**

*"I saw the crescent*
*you saw the whole of the moon."*

*The Waterboys*

## *Introduction*:

Through the incorporation of applied statistics in institutional image analysis, enrollment managers are better able to identify and reach potential markets and to influence interested audiences in the most effective and direct fashion. While there was once a time when institutional marketing was crafted by instinct, increasingly sophisticated technologies and associated analysis of institutional message, media and markets indicate and facilitate more scientific and more rewarding strategies.

Research-based communications programs now define state-of-the-art marketing for colleges and universities in the 1990's. We have observed many award-winning and celebrated marketing pieces fail in their basic mission of assisting in increased student enrollments or enhanced student profiles. Design awards for admissions literature, standing alone as a measure of marketing success, brings to mind the antidote of the doctor who proclaims that "*the operation was a great success ... it's just too bad the patient died.*" Enrollment managers who fully utilize sound research as a basis for marketing and communications programs realize pre-determined outcome measures -- increased enrollments, improved student profiles -- which are directly impacted by marketing messages and initiatives.

Those institutions which can best harness and direct their marketing messages will more successfully meet the recruitment challenges of the current decade. To this end, college and university administrators have and will continue to explore in great detail the subtle relationship which exists between institutional images and student recruitment. Moreover, they will begin to fully understand how these images and messages are received and evaluated by key market segments as well as how the impact of these messages change with the passage of time.

***Methodology:***

Seven months prior to their final enrollment decision, 483 prospective students were telephoned and asked a series of questions eliciting their impressions and attitudes regarding the college-choice process. A stratified random sample of prospective students was drawn with emphasis placed on seven regional markets. A follow-up study on these respondents was performed at the post-enrollment decision stage. Of note:

- each interview lasted approximately 1/2 hour in length,
- 70% of the initial respondents were contacted at the post-enrollment stage,
- information gathered on these students centered on competition, image formation, information sources, psychological traits and general demographics, and
- statistical tests performed include CHAID (an automatic chi-square interaction detector), means comparison tests and factor analysis.

In this study 263 of the respondents were analyzed for their impressions of a specific private institution.[1] Eight images -- each representing a different facet of an institution -- were addressed and measured at both the inquiry and final enrollment stages. These images or issues included: degree of familiarity with the institution, geographic location, employment opportunities after graduation, quality of academic programs, quality of campus life, national reputation, intercollegiate athletic programs and overall value-for-the-price. The institution these students evaluated was the students' first-choice school at both the inquiry and final enrollment stage.

Five distinct market segments were investigated. They include: *Gender* (male and female), *Family-Income Level* (low, moderate, high), *High School Class Rank* (top 5%, 6%-25%, and 26% or higher), *Institutional Type* (public or private), and *Decision Type* (inquiry stage first choice school as the same (Same) or different from the final choice school (Changed)).

These markets were chosen with two reasons in mind. First, gender, family income and high school class rank are marketing niches than can be addressed directly through communications campaigns that utilize either institutionally gathered data or College Board information (e.g. College Search). Secondly, institutional type and decision type serve to accentuate differences between the two primary educational sectors (*public* and *private*) and the images that differentiate those students who know their final enrollment school quite early in the admissions process from students who changed their decision (*same* and *changed*). Chart 1 displays the numeric breakdown of each segment.

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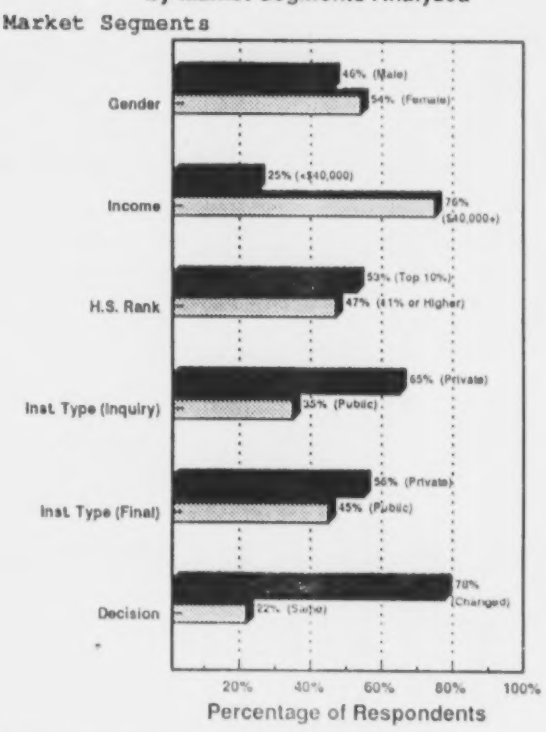
[1] **Only students who had identified a first choice option at both the inquiry and final decision stage are included in this analysis.**

As detailed:

- 54% of the respondents are women,
- The modal family income category is $40,000-$79,999.
- Over 20% of these respondents rank in the top 5% of their high school class.
- 65% of these students selected a private school as their first choice option at the inquiry stage.
- When the final enrollment decision was made 55% of the students chose to enroll in a private college/ university.

**Chart 1**
**A Distribution of Respondents by Market Segments Analyzed**




Three statistical techniques were used to measure the varying impact specific institutional images have on the college selection process. First, means comparison tests (both t-test and Analysis of Variance) were used to evaluate the relative impact each image has on the college selection process. Secondly, a chi-square technique called CHAID was used to help identify the image(s) that best differentiates two groups within a specific market segment. Lastly, a factor analysis was conducted in an attempt to move away from the dangers of single attribute analysis and toward the arena of sophisticated image analysis.

**Data Analysis and Discussion:**

The primary focus of this section involves student perceptions of specific institutional images and how these perceptions change over time. Table 1, on the following page, displays the average (mean score) rating each institutional image received, by market segment, at two distinct stages of the admissions process. Additionally, this table shows whether the students' perceptions have changed significantly over time. As one would hypothesize, among all students the degree of familiarity with their first choice school rises as they move toward their final enrollment decision.

***Gender***. At the inquiry stage women inquirers, more than men inquirers, are inclined to cite the important role quality academic programs and campus life ambience will play in their enrollment decision. Table 1 shows that when the focus of attention changes to the final enrollment stage, women, more than men, find an institution's national reputation playing a more significant role in their enrollment decision.

## Table 1

*Mean Score Analysis: Institutional Images by Market Segments*

| IMAGE / MARKET SEGMENTS | Familiarity | | Geographic Location | | Employment Oppt. After Graduation | | Quality of Academic Programs | | Quality of Campus Life | | National Reputation | | Athletic Programs | | Value for the Price | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inquiry | Final | Inquiry | Final | Inquiry | Final | Inquiry | Final | Inquiry | Final | Inquiry | Final | Inquiry | Final | Inquiry | Final |
| Gender | | | | | | | | | | | | | | | Inquiry | Final |
| Male (N=122) | 3.81 | 4.68* | 4.07 | 4.01 | 4.29 | 4.11* | 4.27 | 4.32 | 4.02 | 4.14 | 3.85 | 3.68* | 3.53 | 3.56 | 3.99 | 4.25* |
| Female (N=141) | 3.89 | 4.68* | 4.22 | 4.16 | 4.36 | 4.23 | 4.46 | 4.37 | 4.28 | 4.32 | 4.00 | 3.93 | 3.65 | 3.57 | 4.18 | 4.42* |
| Family Income | | | | | | | | | | | | | | | | |
| Less Than $40,000 (N=47) | 3.68 | 4.60* | 4.22 | 4.07 | 4.32 | 4.15 | 4.30 | 4.36 | 4.19 | 4.06 | 3.81 | 4.06 | 3.16 | 3.54 | 3.98 | 4.23 |
| $40,000-$79,999 (N=91) | 3.86 | 4.67* | 4.02 | 3.97 | 4.37 | 4.17* | 4.39 | 4.25 | 4.12 | 4.19 | 3.94 | 3.60* | 3.81 | 3.62 | 4.04 | 4.28* |
| $80,000 or Higher (N=52) | 3.92 | 4.71* | 4.35 | 4.16 | 4.26 | 4.27 | 4.31 | 4.47 | 4.26 | 4.31 | 3.92 | 3.82 | 3.65 | 3.47 | 4.27 | 4.45 |
| H. S. Class Rank | | | | | | | | | | | | | | | | |
| Top 5% (N=52) | 3.85 | 4.81* | 4.35 | 4.31 | 4.51 | 4.25 | 4.51 | 4.48 | 4.41 | 4.29 | 4.28 | 4.06 | 3.61 | 3.63 | 4.04 | 4.41* |
| 6%-25% (N=171) | 3.86 | 4.67* | 4.12 | 4.04 | 4.34 | 4.17* | 4.39 | 4.29 | 4.13 | 4.27* | 3.95 | 3.74* | 3.67 | 3.61 | 4.09 | 4.37* |
| 26% and Higher (N=31) | 3.97 | 4.52* | 4.13 | 4.00 | 4.14 | 4.10 | 4.20 | 4.43 | 3.90 | 3.97 | 3.33 | 3.53 | 3.21 | 3.41 | 4.30 | 4.23 |
| Inquiry, Inst. Type | | | | | | | | | | | | | | | | |
| Private School (N=171) | 3.76 | 4.70* | 4.18 | 4.15 | 4.37 | 4.24 | 4.45 | 4.37 | 4.15 | 4.29* | 4.05 | 3.93 | 3.48 | 3.61 | 3.98 | 4.40* |
| Public School (N=92) | 4.03 | 4.63* | 4.11 | 3.99 | 4.27 | 4.05* | 4.25 | 4.29 | 4.20 | 4.14 | 3.78 | 3.59 | 3.76 | 3.49* | 4.28 | 4.23 |
| Final, Inst. Type | | | | | | | | | | | | | | | | |
| Private School (N=144) | 3.91 | 4.68* | 4.14 | 4.20 | 4.40 | 4.31 | 4.44 | 4.32 | 4.13 | 4.28* | 4.07 | 3.95 | 3.55 | 3.60 | 4.00 | 4.22* |
| Public School (N=119) | 3.79 | 4.67* | 4.18 | 3.96* | 4.25 | 4.01* | 4.29 | 4.24 | 4.21 | 4.19 | 3.76 | 3.64 | 3.65 | 3.53 | 4.21 | 4.48* |
| School Decision | | | | | | | | | | | | | | | | |
| Has Changed (N=205) | 3.83 | 4.67* | 4.14 | 4.07 | 4.34 | 4.09* | 4.37 | 4.31 | 4.13 | 4.21 | 3.87 | 3.75 | 3.52 | 3.49 | 4.05 | 4.31* |
| The Same (N=54) | 3.93 | 4.69* | 4.22 | 4.17 | 4.31 | 4.47 | 4.38 | 4.46 | 4.31 | 4.34 | 4.17 | 4.06 | 3.87 | 3.85 | 4.24 | 4.47 |

Note: ☐ represents instances where significant 'paired-comparison' differences occur.

Note: * represents instances where perceptions change significantly over time.

For men, the perceived employment opportunities after graduation and the institution's national reputation played a lesser role in their college decision. At the inquiry stage men and women attach a similar level of importance to an institution's national reputation. However, when the final decision was made, women still attached a high level of importance while men, on average, down-played its role in their decision. For both men and women the value for the price element increased in importance when making their final enrollment choice.

***Family Income***. At the inquiry stage athletic programs play a more important role in the college choice decision for moderate-income students than for low-income students. This issue rates relatively low in terms of importance for all students and there is no significant difference noted among these students at the final decision stage on this issue. Low-income students are more likely than moderate-income students to cite the importance of national reputation in their college choice decision.

As moderate-income students move down the admissions funnel, the importance of employment opportunities after graduation and national reputation lessen. These same students attach a greater degree of importance to the quality of campus life and value-for-the-price issues in their enrollment decision.

***High School Class Rank***. Students who rank in the top 5% of their class cite the importance of a quality campus life more often than do their lowest ranking counterparts. At this same stage, the low-ranking students do not find an institution's national reputation to be critically important to their college choice decision. For students whose high school rank is between 6% - 25%, the perceived employment opportunities after graduation and national reputation diminish in importance at the final decision stage. Among this group of students, the quality of campus life and the overall value for the price increase significantly in terms of importance.

***Institutional Type (Inquiry Stage)***. At the onset of the college choice process, students who chose a public rather than a private institution were more familiar with their first choice school. Similarly, these same students believed at this stage that the public institutions were a better value-for-the-price. Those students who chose a private school as their first choice option attached a greater degree of importance to the issues of quality academic programs and national reputation.

Table 1 shows that at the final enrollment stage the issue of national reputation continues to differentiate these two groups of students. The student who initially chose a private institution places a greater degree of importance on the reputation of the school than does the student who chose a public sector institution.

Table 1 also displays the perceptual changes from the inquiry to final enrollment stages for students who expressed an interest in public institutions; they place a lesser degree of importance on the issues of employment opportunities and athletic programs. The students who chose a private institution, on the other hand, place more importance on the quality of campus life and the overall value-for-the-price.

***Institutional Type (Final Stage)***. There are clear differences among these students when classified by the type of institution they chose for enrollment. Although only the issue of national reputation serves to differentiate these students at the

inquiry stage, this study finds that those students who enrolled in a private institution assign a higher degree of importance at the final enrollment stage to the issues of geographic location, employment opportunities after graduation, the quality of the academic programs, the quality of campus life and the national reputation of the school than did those students who enrolled in a public institution. Only one issue -- value-for-the-price -- is more important to students who enroll in a public institution.

The perceptions that significantly changed over time for those students who enrolled in a private institution were the quality of campus life and the value-for-the-price. In both instances the perceptions of importance increased. For those students who enrolled in a public institution the issues of geographic location and employment opportunities diminished in importance while the value-for-the-price perception increased in importance.

***School Decision***. At the inquiry stage those students who committed early to their first choice school attached a greater degree of importance to athletics than did other students. Table 1 shows that at the final enrollment stage these same students perceived employment opportunities after graduation to be critical to their enrollment decision. Moreover, this group valued the national reputation of the institution they enrolled in more so than students who changed their school option as they moved toward their final enrollment decision.

Table 2 moves the focus from an analysis that compares the impact certain *stand-alone* images have on a student's college choice decision to an analysis that focuses on the specific cluster images that serve to best differentiate between two groups of students within each market segment. To this end, CHAID analysis was performed on the five market segments. The eight institutional images analyzed in Table 1 (familiarity, geographic location, employment opportunities after graduation, quality of academic programs, quality of campus life, national reputation, athletic programs and value-for-the-price) were used as independent predictors of group membership (e.g. the group a student belongs to in each market segment).

CHAID analyzes the individual response patterns to determine which image cluster can best differentiate between two groups of students (e.g. men and women). For example, Table 2 shows that 46% of the inquiry pool are men. If this institution sought to increase the number of males within its inquiry pool it would need to stress aspects of the institution other than campus life. Indeed, when students state that campus life issues play an important role (importance ratings of 4 or 5) in their enrollment decision the percentage of men in the inquiry pool decreases from 46% to 41%. Conversely, if students do not find the issue of campus life to be of critical importance (importance ratings 2 or 3) the percentage of men in the inquiry pool rises to 59%. It is important to note, however, that nearly 70% of the students found campus life to be an important criterion in their enrollment decision.

For top-quality students (those ranking in the top 10% of their high-school class), high quality academic programs are important. At the inquiry stage, if students state that quality academic programs will play a very important role (importance rating of 5) in their college decision the percentage of students in the inquiry pool who rank in the top 10% of their class rises from 46% to 69%.

Significant predictors are found at both the inquiry and final decision stages for students who did not enroll in their inquiry stage first choice school (78%). At the

inquiry stage, those students who find an institution's national reputation to be of little importance in their enrollment decision (importance rating of 1) are the least likely to change their school choice with the passage of time (61%). Those students who are most likely to change their decision are the ones who place a moderate degree of importance on national reputation (importance ratings of 2 or 3); 92% of these students do not enroll in the school they identified as their first choice option at the inquiry stage.

At the final decision stage the perceived employment opportunities after graduation serve best to differentiate students on changed first choice. If students cite the employment issue as playing a very important role in their final decision (importance rating of 5) the likelihood of changing their inquiry choice decision school is only 66%. For those who find employment opportunities to be less to moderately important (importance ratings of 1-4) *and* who cite as critical the importance of national reputation (importance rating of 5) the percentage of students who will not change their inquiry choice school decision is 67%.

As might be expected, value-for-the-price becomes critical to the understanding of why a student chooses a private over a public institution. At the inquiry stage, among students who do not place a great deal of importance on this issue (importance ratings of 1 and 2) the percentage choosing a private institution as their first choice option decreases from 65% to 8%. Yet, if this is a moderately important issue (importance ratings of 3 or 4) the percentage choosing a private institution is 51% and 79%, respectively. Among those who evaluated this issue as moderately important (importance rating of 3) *and* who cite the importance of national reputation (importance rating of 4 and 5) the percentage choosing a private institution as their first choice option increases to 88%.

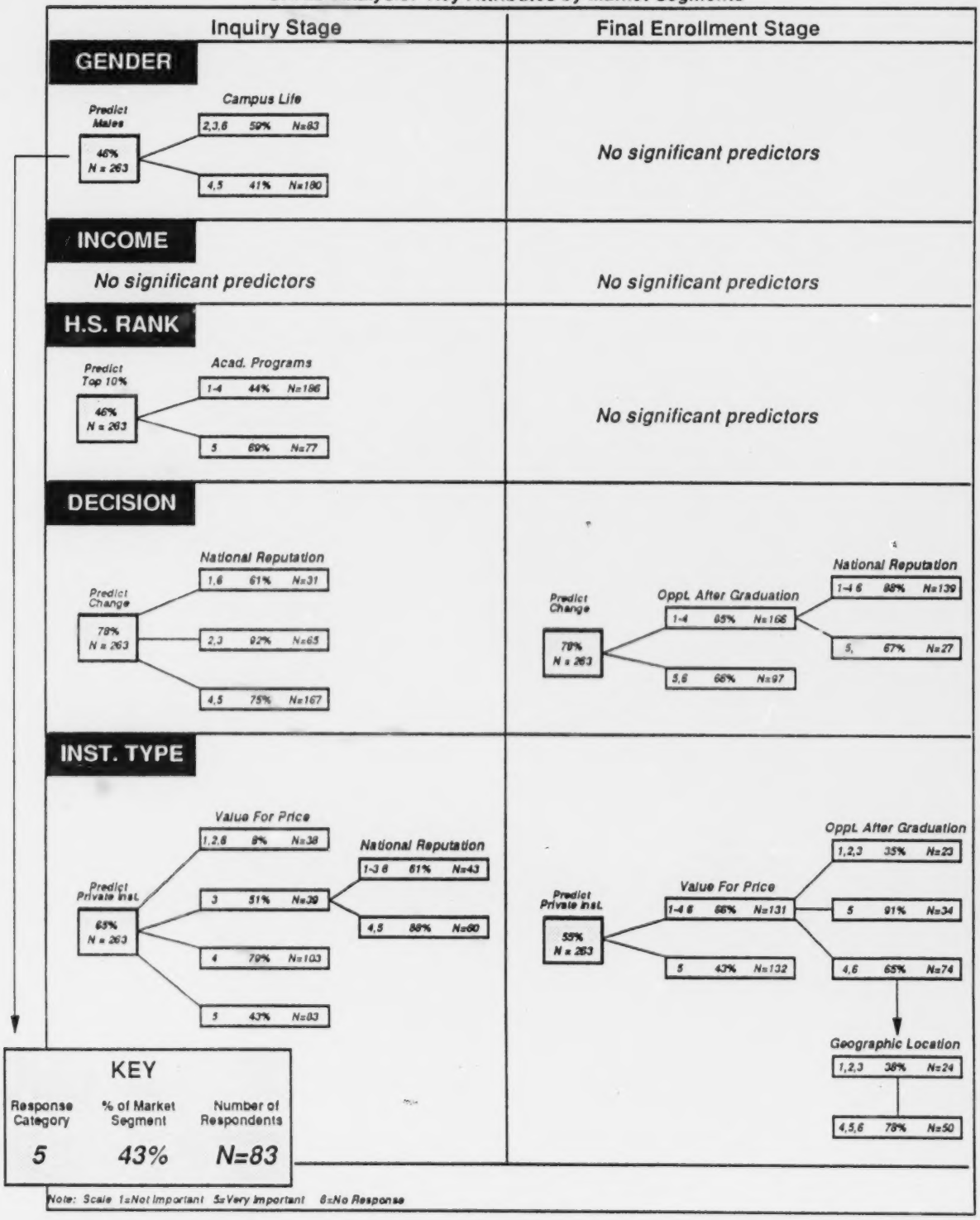
When the focus of attention switches to the final enrollment stage the issue of value-for-the-price continues to dominate. If students see this issue as very important (importance rating of 5) the percentage of those who will enroll in a private institution decreases from 55% to 43%. However, if this issue is seen to be low to moderately important (importance ratings of 1-4) the percentage enrolling in a private institution increases from 55% to 66%. Following this latter group of students, if they also find very important (importance rating of 5) the issue of employment opportunities after graduation the percentage of students enrolling in a private institution increases to 91%.

Table 3 reveals the results of a factor analysis conducted at both the inquiry and final decision stages of the admissions process as well on the changes which occur in students' perceptions. A tenet of this paper is that disparate images interact and change over time to provide an institution with the opportunity to prioritize the messages it sends to the educational marketplace.

At the inquiry stage the cluster message which resonates strongest involves non-academic issues. Visibility seems to be the key. The attributes contributing most to this message involve intercollegiate athletic programs, the quality of campus life and the overall value-for-the-price. The linkage between athletic programs and campus life is interesting, intimating that athletics, in this context, may be valued more for atmospherics than for its actual sporting element.

## Table 2

*CHAID Analysis: Key Attributes by Market Segments*



## Table 3

*Factor Analysis: Salient Images and Message Penetration*

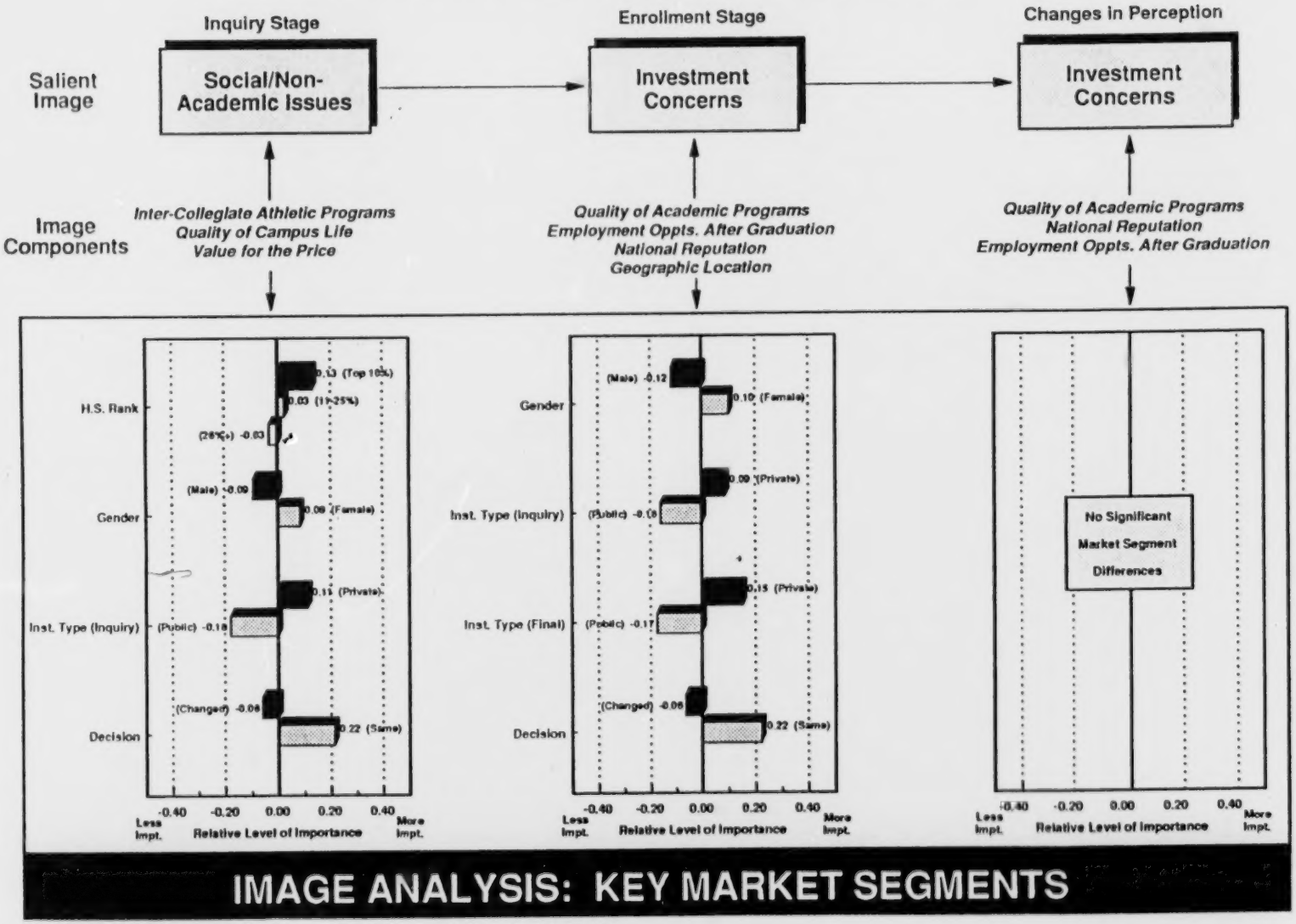



**IMAGE ANALYSIS: KEY MARKET SEGMENTS**

*Note: Only market segments where significant differences appear are displayed.*

When focusing on specific market segments we note that four groups display significant differences. In general, students who rank in the top 5% of their high school class, females, those choosing a private institution or those who were committed early to their final college choice attach more importance to a message of atmospherics. This suggests that a marketing brochure directed at inquirers and prospects highlighting personable, friendly campus interaction may carry a more effective message, especially to female rather than male students, top quality rather than moderate quality students and students who display a preference for private over public institutions.

At the final enrollment stage a noticeable change in message impact is seen. Whereas non-academic issues dominate at the inquiry stage, Table 3 shows that academic and investment outcome issues rise to forefront at the final enrollment stage. It appears that students, in general, are drawn toward an institution due to visibility and atmospheric issues but base their final enrollment decision on a more substantive set of criterion. Four images significantly contribute to this image: quality of academic programs, employment opportunities after graduation, national reputation and geographic location.

The academic and investment messages are interpreted as more important by students who are female, who preferred private institutions at both the inquiry and final enrollment stages or who determined their final choice college early in the admissions process. Thus, the changing dimension of message impact is quite important. These findings suggest that students respond differently to institutional messages at different stages of the admissions process. Therefore, the *effectiveness* of a brochure mailing or other marketing initiatives is dependent on *both the content and the timing* of the message. Hypothetically speaking, a brochure that presents an *atmospheric* message may be effective in translating inquiries into applicants. However, this same piece will be less effective in converting these applicants to enrolled students than a brochure that emphasizes issues which center on investment/academic outcome messages.

Lastly, a factor analysis was conducted to further define the themes most important to students at different stages. Confirming the previous findings displayed for the final enrollment stage, this analysis shows that students find issues which relate to academic quality, national reputation and employment opportunities after graduation to be significantly more important as they move closer to their enrollment decision. More importantly, this change in perception is constant across all five market segments analyzed.

**Conclusion:**

The analyses presented in this study give clear indication that certain messages are more salient at particular stages of the enrollment process. These findings indicate that atmospheric rather than academic issues define first choice schools at the inquiry stage, while academic issues such as strong academic programs and perceived employment opportunities after graduation surface to dominate in terms of importance at the point of final enrollment decision. Wise application of these findings will allow an institution to more fully maximize recruitment efforts by asserting the most persuasive messages at the most appropriate moment in time.

# Public Versus Private Education: The Perception of Value and the College-Choice Decision

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*Abstract:*

**The perception of value as it relates to education is critical to understand in these days of budget-cutting and program evaluations. For many students, this perception is best understood as they contemplate the decision to enroll in either a public or private institution. How *"value"* intertwines with students' perceptions of cost and quality is investigated in this paper. Moreover, the perception of value is explored as it relates to the likelihood of students applying and enrolling within a particular institutional type.**

## *Introduction*:

*Trade-offs.* When students contemplate enrolling in one particular institution over another they are both consciously and subconsciously making trade-offs -- matching the positives and negatives of one institution against another. Although these subliminal trade-offs occur throughout the admissions flow process they are most manifest when a student has been accepted to a variety of institutions. It is at this juncture that tough decisions have to be made. It is at this precise moment when a student starts to realize the potential consequences of his/her enrollment decision. The perceived value of the education now becomes juxtaposed with the student's perceived needs and wants. The proposition set forth in this paper is that public institutions become more attractive to a student when s/he defines value heavily in terms of cost, while private institutions become more attractive when the student defines value in terms of experience.

*Ideology.* It is important to note that students do not always engage in a systematic process of elimination of schools from their selection pool; rather, they exclude certain schools because of specific ideological constraints. Although the United States has been described as a "*melting pot*," reality intimates the contrary. The failure of complete assimilation has contributed to the development of an ideology which has social, political and economic components. Given the current -- and accepted -- role social and economic stratification play in the development of ideology it should not be surprising that educational institutions are, as well, analyzed by students in terms of these constraints. This paper focuses on one private university and examines whether ideological barriers indeed have a decisive effect on the *type* of institution an individual chooses to attend.

The ideological components, when viewed through the lens of academia, serve as potential blocking mechanisms for students as they contemplate their college-choice decision. A comprehensive discussion of these blocking mechanisms at the ideological level is needed if enrollment managers are to fully understand why specific *college*

*types* are precluded from the prospective students' college choice set. Although this paper addresses specific reasons why a student may choose one particular institution over another it can only tangentially address the blocking mechanisms which serve to dictate or direct the student's college selection process.[1]

Given that the educational sector is a primary vehicle in the transmission of ideology, any change in the current social structure has clear ramifications on the shape, direction and role of higher education. For example, in many colleges and universities today, a potential conflict is developing in the area of financial aid. This conflict arises because ideology suggests that the opportunity to attain higher education should not be dictated by individual finance; yet, current-day economics *are* premised on the fact that the individual, not the government, bears primary responsibility for supporting higher education. Given this scenario, it is important to note whether students from low-income families are more likely to identify with and enroll in a public institution than are their high-income counterparts.

**Methodology**:

A selected random sample of nearly 500 prospective college students was interviewed over the phone during the fall semester of their senior year in high school.[2] The interviews, each lasting approximately 30 minutes in length, addressed issues concerning college choice options, evaluations of specific institutions and an assessment of personal goals and objectives. Nine months later, 263 of these students were again contacted and asked questions concerning their college choice decision. These questions allowed for a *'pre-test post-test'* assessment on why students identified a specific institution as their first-choice option at the inquiry stage and what factors, if any, caused them to change their decision at the final enrollment decision stage.

These prospective students evaluated seven characteristics as to their relative influence on the college choice decision at both the inquiry and enrollment stage. These characteristics evaluated for quality/importance included: geographic location, academic programs, campus life, reputation nationally, inter-collegiate athletic program, employment opportunities after graduation and the overall *value for the price*. The latter two characteristics represent direct investment outcomes for these students. It is our hypothesis that the degree to which these investment outcomes influence the final enrollment decision varies based on specific student socio-demographic attributes.

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**[1] For example, the contemplation of attending an all-black institution such as Howard University may never enter the mind of a non-black student. On a more subjective or non-ascribed level, the idea of attending a very expensive university may never enter the mind of a prospective student whose family is not financially well-endowed. Hence, the idea of *costs* as it relates to *value* is important to understand since the perception of value may be a latent function of costs.**

**[2] The students in this study were inquirers to a highly selective private institution situated on the outskirts of a major Northeastern city. A stratified sample of students was drawn from the inquiry pool based on major regional markets. Those students who did not report a first choice school option at the inquiry stage were eliminated from the analysis. In all, the college selection processes of 263 prospective students were subjected to this detailed analysis.**

In an attempt to understand the enrollment decision process two *indicator* variables are used: institutional type (public or private) and family income (low-income or high-income).

Throughout this paper references are made to describe specific groupings of students and key market segments. They are:

- ***Institutional Type***: The type of institution, either public or private, to which the student stated was their first-choice option at both the inquiry and final enrollment stage.
- ***Private-Private***: A student whose first-choice option at both the inquiry and final-enrollment stages was privately controlled.
- ***Public-Public***: A student whose first-choice option at both the inquiry and final-enrollment stages was publicly controlled.
- ***Public-Private***: A student whose first-choice option at the inquiry stage was publicly controlled but at the enrollment stage was privately controlled.
- ***Private-Public***: A student whose first-choice option at the inquiry stage was privately controlled but at the enrollment stage was publicly controlled.
- ***Family Income***: The low-family income category represents a student who reports a total family income of < $60,000. The high-family income category refers to a student who reports a family income of $60,000 or higher.
- ***Tuition Costs***: The tuition cost for each institution selected by students at both the inquiry stage and final enrollment stage was collected. The dollar amount does not include room and board costs.

Analysis of variance (ANOVA) and stepwise regression techniques are used in this paper. ANOVA is used to investigate both differences and changes in students' perceptions of their first-choice school as they progressed through the admissions funnel. The seven institutional characteristics along with tuition costs are measured for group effects across the four college choice options (Table 1).

A stepwise regression technique is used to assess the impact the seven characteristics (and the two indicator variables, institutional type and family income level) have on two dependent variables: perception of value and tuition costs.

***Data Analysis and Discussion:***[3]

Chart 1 shows the distribution of students across two institutional types -- public and privately controlled institutions. The data show that 171 of the 263 students interviewed chose a privately controlled institution as their first-choice option at the inquiry stage (65% of all inquirers). However, when the final enrollment decision was made, only 141 students actually enrolled in a private institution (55% of all inquirers).

**Chart 1**
**A Distribution of Respondents by Institutional Type**

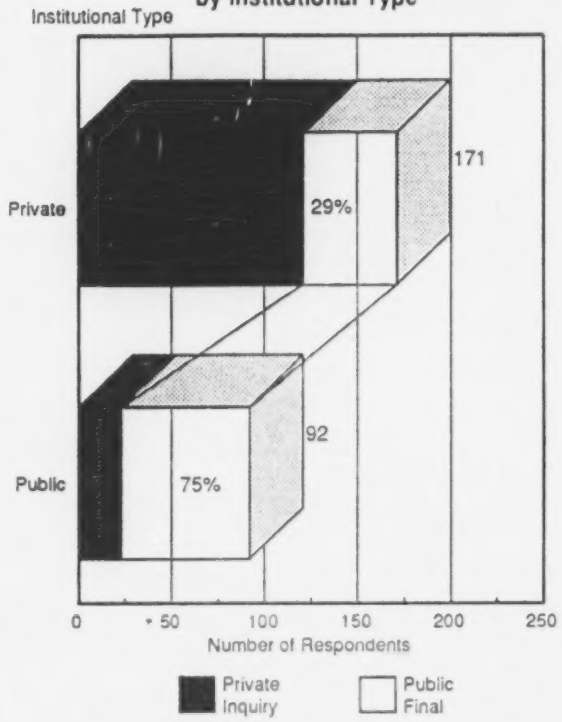


Table 1, presents an analysis of eight institutional attributes by four groups. This table measures the change in students' perceptions as they progressed down the *admissions funnel.*

As one would expect, these students became significantly more familiar with their final choice school as they moved from the inquiry stage to the final enrollment stage. Those inquirers who expressed an interest in a private institution at the inquiry stage but enrolled in a public institution experienced significantly more change in

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[3] **A more detailed analysis of the data reveal that 71% of the students who chose a private institution at the inquiry stage enrolled within a private college. Similarly, 75% of the students who chose a public institution at the inquiry stage enrolled within a public institution.**

**Although not detailed, this study found that 19% of these students changed their institutional type from private to public while only 9% changed their institutional type from public to private. It becomes quite clear, then, that at the inquiry stage the vast majority of students have already selected the arena in which they will compete. The question arises, then, are certain ideological mechanisms at work that preclude a private school option for some students or discourage others from attending a public institution due to a perception of prestige and reputation (the latter point suggesting not only the reputation of the institution but the *reputation* of the family involved in the college selection process).**

## Table 1

***First Choice School Attributes by Four Group Classification***
***(Inquiry Stage and First Choice Stage Comparison)***

| Attributes | Inq.: Private Final: Private Average | Inq.: Private Final: Public Average | Inq.: Public Final: Private Average | Inq.: Public Final: Public Average | Significant Differences |
|---|---|---|---|---|---|
| ***FAMILIARITY*** | | | | | |
| Inquiry Stage | 3.85 | 3.53 | 4.22 | 3.97 | no sign. diff. |
| Final Choice Stage | 4.68 | 4.76 | 4.70 | 4.61 | no sign. diff. |
| Net Difference | -.8034 | -1.245 | -.4783 | -.6377 | 4,2 |
| ***GEOGRAPHIC LOCATION*** | | | | | |
| Inquiry Stage | 4.16 | 4.25 | 4.04 | 4.13 | no sign. diff. |
| Final Choice Stage | 4.20 | 4.04 | 4.23 | 3.90 | no sign. diff. |
| Net Difference | -.0286 | +.2500 | -.1364 | +.2239 | no sign. diff. |
| ***OPPORTUNITIES AFTER GRADUATION*** | | | | | |
| Inquiry Stage | 4.40 | 4.31 | 4.43 | 4.22 | no sign. diff. |
| Final Choice Stage | 4.34 | 3.98 | 4.13 | 4.03 | 1-2 4 |
| Net Difference | +.0500 | +0.3947 | +0.2381 | +.2031 | no sign. diff. |
| ***QUALITY OF ACADEMIC PROGRAMS*** | | | | | |
| Inquiry Stage | 4.45 | 4.23 | 4.35 | 4.21 | no sign. diff. |
| Final Choice Stage | 4.45 | 4.20 | 4.35 | 4.28 | no sign. diff. |
| Net Difference | -.0192 | +.250 | +.0000 | -.0455 | no sign. diff. |
| ***CAMPUS LIFE*** | | | | | |
| Inquiry Stage | 4.09 | 4.32 | 4.33 | 4.15 | no sign. diff. |
| Final Choice Stage | 4.30 | 4.24 | 4.13 | 4.15 | no sign. diff. |
| Net Difference | -.2525 | -.0154 | +.1429 | +.0000 | no sign. diff. |
| ***NATIONAL REPUTATION*** | | | | | |
| Inquiry Stage | 4.11 | 3.88 | 3.87 | 3.69 | 1,4 |
| Final Choice Stage | 4.03 | 3.78 | 3.57 | 3.60 | 1,4 |
| Net Difference | +.1333 | +.2000 | +.3040 | +.0625 | no sign. diff. |
| ***ATHLETIC PROGRAMS*** | | | | | |
| Inquiry Stage | 3.52 | 3.40 | 3.70 | 3.78 | no sign. diff. |
| Final Choice Stage | 3.61 | 3.61 | 3.52 | 3.48 | no sign. diff. |
| Net Difference | -.0045 | -.2941 | +.1905 | +.3385 | no sign. diff. |
| ***VALUE FOR THE PRICE*** | | | | | |
| Inquiry Stage | 3.97 | 4.00 | 4.13 | 4.33 | 4,1 |
| Final Choice Stage | 4.31 | 4.62 | 3.78 | 4.38 | 3-1 4 2 |
| Net Difference | -.3564 | -.5750 | +.3478 | -.0462 | 4,2 3-2 1 |
| ***AVERAGE TUITION COST*** | | | | | |
| Inquiry Stage | $12,177 | $12,276 | $2,306 | $1,805 | 1-4 3 2-4 3 |
| Final Choice Stage | 11,188 | 1828 | 10,126 | 1,751 | 3-4 2 1-4 2 |
| Net Difference | -1,007 | -10,448 | +7,820 | -54 | 1,2 4-2 1 3-2 1 4 |
| Sign. Diff. Code: | (1) | (2) | (3) | (4) | |

terms of their familiarity with their chosen school than did students who were interested in public institutions at both the inquiry and final enrollment stages.[4]

On four attributes, geographic location, academic programs, campus life and athletic programs, no significant differences emerged which serve to differentiate between the four groups of students. Among these four attributes, the quality of the academic program was evaluated quite highly by these students. Conversely, the quality assessments of these institutions' athletic programs were less positive.

The perceived employment opportunities after graduation become a differentiating issue at the final enrollment stage. Students who opted for a private institution at both the inquiry and final enrollment stage are more apt to assess their final choice school more positively on this aspect than do those students who enrolled in a public institution.

When focusing on the image of national reputation Table 1 shows that students who indicated a private institution as their first-choice option at both the inquiry and final enrollment stages are more interested in a school's reputation than are their public school counterparts. The issue of value for the price takes on significant importance for most students as they progress through the admissions cycle. Those students experiencing the greatest change in perception are those who indicated a private school preference at the inquiry stage but enrolled in a public institution. Conversely, the issue of value for the price became less important for students who indicated a public school preference at the inquiry stage but ultimately enrolled in a private institution. Interestingly, it appears that students who indicated a private school at the inquiry stage seem to be the most cognizant of the overall value of an education.

Lastly, Table 1 shows that tuition costs vary across groups as well as through the passage of time. The data clearly indicate that most students become more 'cost' conscious as they move toward their final enrollment decision. Even among students who chose a private institution at both the inquiry and final enrollment stages the average tuition cost declined by over $1,000. Interestingly, those students who switched their college choice from private to public saved, on average, over $10,000 in tuition. However, those students who switched their choice from public to private incurred an increase in tuition of only $7,820.

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[4] **An analysis of variance test was performed on these eight attributes. Tukey's HSD paired comparison test was used to measure significant differences between groups. In all instances where significant differences emerge between two or more categories, the overall model was significant ($p < .05$).**

**Although not shown, no significant differences emerge among the four groups when focusing on gender, ethnicity, 1st generation and academic ability (Rank and SATs). Those students who attended a public high school show a greater propensity to identify and attend a public college/university. Conversely, those students who attended a private high school are more likely to identify and attend a private college/university. This finding may be related to family income where the data show that students from low family incomes are more prone to identify a private college at the inquiry stage but enroll in a public institution. Similarly, those students from high income families are more apt to identify and enroll in a private institution.**

**Table 2**

***Stepwise Regression Analysis: Value and Costs Regressed on Selected Institutional Images and Attributes***

***Inquiry Stage:***

Results of Stepwise Regression of "Value for the Price" on Selected Institutional Images and Attributes

| Independent Variable | β | $s_\beta$ | b | t-value |
|---|---|---|---|---|
| Oppt. After Graduation | 0.461 | 0.093 | 0.372 | 4.975 |
| Inquiry, Inst. Type | 0.378 | 0.134 | 0.211 | 2.812 |
| Intercept | 1.890 | 0.413 | | 4.579 |

$R^2$ = .179

Results of Stepwise Regression of Tuition Cost at the Inquiry Stage on Selected Institutional Images and Attributes

| Independent Variable | β | $s_\beta$ | b | t-value |
|---|---|---|---|---|
| Quality Acad. Programs | 2228 | 537 | 0.329 | 4.154 |
| Value for the Price | -1252 | 503 | -0.200 | -2.488 |
| Athletic Programs | -999 | 415 | -0.185 | -2.326 |
| Intercept | 7162 | 2818 | | 2.541 |

$R^2$ = .150

***Enrollment Stage:***

Results of Stepwise Regression of "Value for the Price" on Selected Institutional Images and Attributes

| Independent Variable | β | $s_\beta$ | b | t-value |
|---|---|---|---|---|
| Quality Acad. Programs | 0.355 | 0.084 | 0.304 | 4.244 |
| Final, Tuition Costs | -5.6E-05 | 1.27E-05 | -0.346 | -4.428 |
| Athletic Programs | 0.121 | 0.054 | 0.158 | 2.250 |
| Inquiry, Inst. Type | -0.391 | 0.128 | -0.231 | -3.065 |
| Family Income | 0.257 | 0.113 | 0.156 | 2.268 |
| Intercept | 2.753 | 0.368 | | 7.474 |

$R^2$ = .225

Results of Stepwise Regression of Tuition Cost at the Enrollment Stage on Selected Institutional Images and Attributes

| Independent Variable | β | $s_\beta$ | b | t-value |
|---|---|---|---|---|
| Oppt. After Graduation | 1334 | 572 | 0.192 | 2.333 |
| Value for the Price | -1682 | 449 | -0.272 | -3.743 |
| Quality Acad. Programs | 1285 | 593 | 0.178 | 2.168 |
| Geographic Location | 852 | 420 | 0.149 | 2.027 |
| Family Income | 1625 | 705 | 0.160 | 2.304 |
| Intercept | -1289 | 2754 | | -0.468 |

$R^2$ = .194

***Variables Included in the Stepwise Analysis***

A: Institutional Type
B: Income Group
C: Tuition Costs, First Choice School
D: Geographic Location
E: Opportunities After Graduation
F: Quality of Academic Programs
G: Quality of Campus Life
H: Reputation, Nationally
I: Quality of Athletic Programs
J: Value for the Price

Note: Only variables which met the $p < .05$ criterion were included in the final analysis.

Table 2 presents the results of four stepwise regression procedures. Changes in two dependent variables, *value for the price* and *tuition costs*, are measured against a series of institutional images and attributes.[5] As noted, these analyses encompass information gathered both at the inquiry and final enrollment stages.

[5] For brevity sake, only variables which add significant understanding to the overall model are presented.

***Value for the Price***. At the inquiry stage only two variables -- employment opportunities after graduation and institutional type -- significantly interact with the students' perceptions of value. These two variables explain nearly 18% of the variance in this dependent variable. This finding suggests that certain students, even at this stage, choose an institution based on its relative value for the price.

However, when the focus of attention switches to the enrollment stage, we find several variables which interact with these students' perception of value. At this stage positive assessments of an institution's academic and athletic programs serve to enhance the perception of value while increasing tuition costs serve to diminish this perception. Two variables, family income and institutional type, also interact with these students' perception of value.

***Tuition Costs***: Three attributes -- quality of academic programs, value for the price and athletic programs -- interact significantly with an institution's tuition costs. Simply stated, the more positively students assess an institution's academic programs the more willing they are to pay higher tuition costs. Conversely, value for the price and athletic programs have an inverse relationship with tuition costs -- as the assessment of these two attributes increases the likelihood of paying a high tuition cost decreases.

Table 2 shows that at the enrollment decision stage these students clearly associate certain investment outcome measures with the amount of dollars they are willing to invest into their college education. When students perceive positively the quality of an institution's employment opportunities after graduation, its academic programs, and its geographic location they are willing to pay more dollars for their education. Yet, the perception of value decreases as tuition costs increase. As with the perception of value, a student's family income level significantly interacts with the amount of tuition dollars s/he is willing to pay.

Table 3 moves the analysis and discussion away from the realm of statistics to the realm of application. Through the use of prediction equations it is possible to assess the impact specific institutional images have on the perception of value. Moreover, it is possible to measure how the institutional type a student chooses -- either private or public -- impacts upon his/her perception of the institution itself. Related back to the initial discussion of ideology and potential blocking measures, it is through this form of analysis that it becomes possible to assess the impact family income has on the perceptions of value.

Table 3 shows that, at the inquiry stage, family income does not significantly interact with students' perceptions of value or with the tuition costs they are initially willing to pay. However, among those students who selected a public institution at the inquiry stage, there is a greater inclination to perceive a high value for the price. At this initial stage only one image -- the perceived employment opportunities after graduation -- significantly interacts with the students' perception of value.

Students at the inquiry stage are inclined to pay higher tuition prices if they perceive an institution as having quality academic programs. Operating in an inverse direction, the more positively these students assess an institution's athletic program and the relative value for the price, the less willing they are to part with their tuition dollars.

**Table 3**

***Value and Costs: Inquiry and Enrollment Stage Analyses***

***Inquiry Stage:***

Value = 1.89 + 0.46(E) + 0.38(A)

3.89 = 1.89 + 0.46(4.35) + 0.38(0)

4.27 = 1.89 + 0.46(4.35) + 0.38(1)

Institutional type preference at the inquiry stage significantly interacts with the perception of value.

Costs = 7161.59 + 2229(F) + -1252(J) + -966(I)

$8,033 = 7162 + 2229(4.25) + -1252(4.07) + -966(3.63)

(Institution Type & Income Group do not contribute significantly to the model).

***Enrollment Decision Stage:***

Value = 2.75 + 0.355(F) + 0.121(I) + -5.60107E-05(C) + -0.391(A) + 0.257(B)

4.36 = 2.75 + 0.36(4.35) + 0.12(3.56) + -5.6E-05($6,853) + -0.39(0) + 0.257(0)

3.97 = 2.75 + 0.36(4.35) + 0.12(3.56) + -5.6E-05($6,853) + -0.39(1) + 0.257(0)

4.61 = 2.75 + 0.36(4.35) + 0.12(3.56) + -5.6E-05($6,853) + -0.39(0) + 0.257(1)

4.22 = 2.75 + 0.36(4.35) + 0.12(3.56) + -5.6E-05($6,853) + -0.39(1) + 0.257(1)

Costs = -1289 + 1334(E) + -1682(J) + 1285(F) + 852(D) + 1625(B)

$6,076 = -1289 + 1334(4.19) + -1682(4.32) + 1285(4.35) + 852(4.05) + 1625(0)

$7,700 = -1289 + 1334(4.19) + -1682(4.32) + 1285(4.35) + 852(4.05) + 1625(1)

Not surprisingly, students from high-income families are significantly more likely to enroll in a high-priced institution.

The highest 'value for the price' image is obtained by students who enroll in a private institutution and are from high income families.

*Code and Legend*

A: Institutional Type: 0 = Private 1 = Public
B: Income Group 0 = Low Income 1 = High Income
C: Tuition Costs, First Choice School, Enrollment Stage
D: Geographic Location
E: Opportunities After Graduation
F: Quality of Academic Programs
G: Quality of Campus Life
H: Reputation, Nationally
I: Quality of Athletic Programs
J: Value for the Price

Interesting findings are uncovered when attention is focused on the final enrollment decision. This table shows that family income significantly impacts upon the perception of value as well as the amount of tuition a person is willing to pay. The perception of value is enhanced best when a student: positively assesses an institution's academic and athletic programs, pays a progressively lower tuition rate, enrolls in a private institution, and is from a high-income earning family (perception of value: 4.61).

Given similar assessments as the above regarding the institutional attributes, this table shows that a student from a low-income family who chose to enroll in a public institution has the lowest perception of value. This finding begs the question, if

this student does not believe that s/he is receiving a good value for the money spent what motivates him/her to enroll in a public institution? One possible explanation may be that this student is caught in a vise between what one desires and what one can obtain -- the sociological expression of anomie may be apropos. The low-income student understands the value of a private education (see their cohorts who have chosen this path) but this option may be viewed as too risky. Interestingly, a student from a high-income family who chose to enroll in a public institution is able to translate his/her actions into a higher perception of value than do students from lower-income families.

Lastly, but not surprisingly, Table 3 shows that students from high-income families are more likely to enroll in higher-priced institutions than are students from low-income families. Specific attributes -- employment opportunities after graduation, geographic location and quality academic programs significantly interact with the willingness of students to pay a higher tuition rate. The more students evaluate these aspects of an institution positively the more they are willing to part with their educational dollars. Confounding this equation, however, is that the perception of value decreases as tuition costs increase. Clearly, there is an equilibrium that enrollment managers and financial planners have to find between what they offer students and what they charge them for the *opportunity* to attend their institution.

***Conclusion***:

This brief analysis demonstrates that students' perceptions of an institution at the inquiry stage vary from those they held at the final enrollment stage. Although this analysis was just a brief introduction to the idea that certain students are curtailed in their college choice decisions by specific ideological blocking mechanisms it does illustrate that private institutions, regardless of family income, are held in higher esteem than are public institutions. Furthermore, this analysis shows that students from low-income families are consigned to public institutions even though they realize the limited *value for the price.*[6]

The initial proposition that low-income students would define value in terms of costs while high-income students would define value in terms of experience is only moderately supported in this analysis. Low-income students, as expected, are significantly more cost sensitive than are their high-income counterparts. Yet, supportive of the major theme in this study, family income becomes much more critical at the final decision stage -- ostensibly these students would prefer a private institution but are precluded from this choice primarily because of economic reasons.

An institution has to be aware that certain messages it sends to the student marketplace may preclude certain students from inquiring, applying or enrolling. This paper demonstrates, in a limited sense, the relative advantage private institutions have over public institutions in regard to the argument of value. Given the current

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[6] **Although the argument can be made that many public institution are of high academic quality and, therefore serve as an attractive option for both low and high-income students the main point is that low-income students exclude private schools from their pool of alternatives because they cannot afford attending them. The converse does not occur.**

structure where the marketplace dictates value and students have defined private institutions as a better value for the price, students from low-income families will have a more difficult time competing in the open market for competitive employment opportunities. Given the current financial situations at many institutions, the scarcity of financial aid dollars does not bode well for low-income students. The bifurcation which may result from this strained financial situation may lead to many private institutions to market itself primarily to students from financially well-to-do families who have the ability to pay the ever-increasing tuition costs.

# Who are the Adult Learners in College Today and What Can We Do To Make Their Stay More Palatable?

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With decreasing enrollments of traditional-aged students 18-22 years old, colleges and universities are focusing more on the non-traditional adult learner, either the returning undergraduate or the new adult college enrollee. National Center for Education Statistics data reported that adult students compose 42% of the 12.2 million students enrolled in college, however, according to Aslanian and Brickell (1988),this number may actually be higher with total college enrollment perhaps 13.5 million and the adult share of college credit enrollment also higher when alternate means of collecting such information are utilized. (NCES relies on IPED data - Integrated Postsecondary Education System - which reflects college enrollment as of a given date in October of every year only). Most institutions of higher education provide academic and support services geared to the full-time day traditional student. Most university offices are open 9am - 5 pm. Evening and other nontraditional students, both undergraduate and graduate are for the most part expected to adjust their schedules to conduct "school business" during the day hours of operation, regardless of their own work and family schedules. Now, however, with the surge in adult learners, 25 years of age and older, many institutions are establishing special programs or divisions to deal with the needs and interests of this cohort.

In the Fall of 1985, Fairleigh Dickinson University established an undergraduate adult degree program "Success", at all three of its main campuses in Teaneck/Hackensack, Rutherford and Florham-Madison for adult learners, 25 years of age and older who wished to pursue baccalaureate (B.A., B.S.) degrees in any of the colleges of the university (Colleges of Arts and Science, Liberal Arts, Business Administration and Science and Engineering). These mature students represent individuals who have never gone to college before or those who interrupted their previous college studies and now returned to complete their degree (Hart, Note 1). There are several major benefits in most adult degree programs which are not available to the traditional-aged population: easier admission with simplified applications without SAT scores, proof only of High School or its equivalency, credit for prior learning (assessment of life/work experience by portfolio, standardized exams, etc.), homogeneous-by-age classes taken with other adult learners,

mentors/advisors available at convenient times throughout the calendar year and a support network.

With the inception of the Success Program at FDU, and the appointment of a full-time University Director of Adult Education, a standing university committee was created to address relevant issues of adult education at this institution. The University Advisory Committee on Adult Learners composed of administrators, faculty, professional staff, enrolled adult students and graduates advises the Associate Vice-President for Lifelong Learning Programs, Vice Presidents for Academic Affairs and Student Affairs and the University President of the needs of this unique population. A primary role of this committee is to sponsor an annual University-wide conference on the adult learner. This conference model serves as an effective change agent for educating the university community (Hart, Birnbaum, Grob, & Webb, 1988). During the 1989-90 academic year, the University Advisory Committee required additional information about the profile of the nontraditional adult undergraduate student population which was unavailable from other sources. In 1989 the committee generated an investigator-made survey which was distributed by mail to a random sample of 1262 undergraduate students, 25 years of age and older at all three campuses and in all colleges excluding the College of Dental Medicine. Four-hundred and fifty-five responses were received for a 36% response rate. Of the 455 surveys, 386 were found usable. (Auditors and other non-degree students were excluded from the data analysis).

Frequency distributions were calculated for all questions. Analysis was based on valid percent correcting for missing cases. The following summary of survey findings represents data across all three campuses only, although the university report produced did analyze data by individual campus as well.

## Survey Findings

### Demographic Characteristics

Mean age of the survey respondents (N=386) was 33.48 with a S.D. of 8.18. Median age was 31.00. Age range was 25-69 years. The majority of respondents were female, 61.4%. Part-time student status (81.3%) represented the majority of students, tri-campus. The random sample drew 39.2% of the respondents from Madison, 17.2% from Rutherford and 43.6% from Teaneck/Hackensack. Most of the students were College of Business majors (40.0%) in the Business Management curriculum (24.4%)). The sample represented thirty-five separate majors including undeclared and special. Attendance at FDU was a mean 6.29 years with a S.D. of 4.91, a median of 5.0 years, and a range of 1-32 years. Table 1 represents a summary of the predominent characteristics and their distribution.

Table 1
Predominant Characteristics
and their Distribution (N=386)

| | n | (%) |
|---|---|---|
| *Sex* | | |
| Female | 237 | 61.4 |
| Male | 149 | 38.6 |
| *Student Status* | | |
| Part-time Day | 28 | 7.3 |
| Full-time Day | 36 | 9.4 |
| Part-time Evening | 312 | 81.3 |
| Full-time Evening | 8 | 2.1 |
| *College* | | |
| Liberal Arts | 70 | 18.2 |
| Business Administration | 154 | 40.0 |
| Science & Engineering | 82 | 21.3 |
| Arts & Sciences | 73 | 19.0 |
| *Majors* | | |
| Bio. (COAS) | 7 | 1.8 |
| Chem. (COAS) | 1 | .3 |
| Comp. Sci. | 10 | 2.6 |
| Econ. (BA) | 13 | 3.4 |
| English | 12 | 3.1 |
| Fine Arts | 1 | .3 |
| History | 1 | .3 |
| Humanities (COAS) | 9 | 2.4 |
| Psych. (COAS) | 14 | 3.7 |
| Soc. (COAS) | 1 | .3 |
| Chem. (COLA) | 6 | 1.6 |
| Communications | 9 | 2.4 |
| Econ. (COLA) | 1 | .3 |
| English (COLA) | 5 | 1.3 |
| Fine Arts (COLA) | 2 | .5 |
| Humanities (COLA) | 17 | 4.5 |
| Int. Studies (COLA) | 2 | .5 |
| Pol. Sci. | 1 | .3 |
| Psych. | 8 | 2.1 |
| Soc. | 1 | .3 |
| Acctg. | 23 | 6.0 |
| Bus. Mgmt. | 93 | 24.4 |
| Eco./Fin. (BS) | 19 | 5.0 |
| HRTM | 1 | .3 |
| Mktg. | 19 | 5.0 |
| Bio. (COSE) | 4 | 1.0 |
| Chem. (COSE) | 3 | .8 |
| Civ. ET | 1 | .3 |
| Comp. Sci. (COSE) | 8 | 2.1 |
| Constr. ET | 3 | .8 |
| EE | 26 | 6.8 |

Table 1 (continued)

| *Majors* | n | (%) |
|---|---|---|
| EET | 25 | 6.6 |
| IE (COSE) | 1 | .3 |
| ME | 7 | 1.8 |
| Undeclared/Special | 27 | 7.1 |
| | | |
| *Why Attend College* | | |
| Career advancement | 294 | 76.2 |
| Self-fulfillment | 250 | 64.8 |
| Salary advancement | 133 | 34.5 |
| Career re-entry | 15 | 3.9 |
| Career change | 57 | 14.8 |
| Meet others | 30 | 7.8 |

Individual Profile

The majority of respondents (82.8%) were employed full time. Only 6.8% were not employed while .3% were retired. The remainder were employed part-time. The top three employment areas were: professional service area, 23.2%; manufacturing, 21.6%; and health care, 8.7%. Other employment areas included education, government, retail, clerical, and skilled labor.

When respondents were asked why the selected FDU, the three most often responses were geographic convenience (83.2%), academic reputation (37.6%) and specially Designed Adult Degree Programs (25.6%). Other responses to this question included: recommended by colleagues/family/friends (23.1%), opportunity for life/work experience credit (17.4%), special programs of interest (15.3%), tuition payment plan (14.8%) while other areas were less often selected. These data concur with Aslanian & Brickell's findings in their national survey of 1988.

The top four reasons for attending college likewise are supported by higher education literature. These areas were: career advancement (76.2%), self-fulfillment (64.8%), salary advancement (34.5%) and career change (14.8%). Other areas were less often chosen.

Most of the respondent's educations were financed by their employer (63.2%) while 39.9% were self-financed. Only 11.7% received financial aid with other means of financing affecting only a small amount of students.

Academic services at FDU were evaluated as adequate or better (admissions, registration, bursar, academic advisement, security, food service). However, the majority of adult learners (61.3%) do not avail themselves of support services including the Learning Centers which provide free tutoring, Career Placement, on-campus computer facilities, Counseling Centers, Health Services, Financial Aid, Recreational facilties and student activities.

The question which asked "Which services not presently offered at FDU would you find most helpful?" elicited some useful responses. Most adult students across all three campuses were interested in mail registration (51.3%) and telephone registration (47.2%). An adult student services office was considered helpful by 36.6% while 31.1% of the respondents would like an adult student newsletter. An adult student orientation program, adult student association, adult student lounge and day care facilities were of interest to approximately one-quarter of the respondents or less.

Overall, most adult students at the three campuses prefer attending school at the 5:25-8:00pm class hour (83.9%). Only 16.1% considered the 8:10-10:40pm class hour more convenient. If these respondents had a choice of a 6:00-8:30pm class hour, 37.8% would prefer that time slot vs. 5:25pm, daytime-anytime or 8:10pm. Overwhelmingly, these respondents are not interested in an evening split schedule where class meets for one and one-half hours on two separate evenings (68.3%).

Greater than 3/4s of the respondents plan to continue their education at the graduate level (75.5%). The graduate area of most interest was the MBA (55.2%), with the M.S. (22.6%) and M.A. (14.3%) closely following. These three degrees accounted for a cumulative frequency of 92.1%. The other options made up the balance.

## Discussion

Many of the findings are not surprising. Adult learners have multiple commitments with their education being secondary at best. Hughes and Graham (1990) examined the interaction of multiple life roles of adults. The results of their research showed most adults do experience a wide amount of diversity with many individuals involved in three or more different life roles. A national survey conducted for the Commission on Non-traditional Study (cited in Cross, 1981, pp.98-99) identified perceived barriers to learning including situational barriers that arise from one's situation in life at a given time i.e. home responsibilities, not enough time; institutional barriers which include those policies which discourage adult learners from participating i.e. too difficult to get enrolled, strict attendance policies, inconvenient schedules; and dispositional barriers which are related to the individual's attitude about themselves i.e. afraid that they're too old to go to school, lack of confidence, etc. Each of these obstacles must be overcome or initially prevented from becoming excessive and interruptive to the potential adult learner. Institutional planning to provide services and support can remove many of these barriers.

In other studies of women students alone, (Bruce, Hart & Sullivan , 1988, Note 2) reasons for returning to school paralleled those found in the FDU survey: career-advancement, a combination of career advancement and self-fulfillment, and

self-fulfillment. Interestingly, career re-entry and career change represented only a small percentage of the women surveyed, 6% and 7% respectively. In these same studies, special programs for adult learners were one of the most beneficial services noted by the women students (25.0%). The College Board study which conducted telephone interviews with more than 10,000 households nationwide to assess how adults 25 years of age and older studied for college credit reaffirmed the need for logistical ease and career connections as some of the services most wanted by the nontraditional learner (Aslanian & Brickell, 1988). Texts such as Your Hidden Credentials by Dr. Peter Smith (1986) even recommend certain higher education institutions which satisfy the criteria for being "adult-friendly". Adults more than traditional-age students are ardent consumers and well aware of the investment they make in undertaking college studies. However, just as colleges need to adjust to the large enrollments of adult students, re-entry students must realize "...that universities were born in the Middle Ages and retain some of their medieval character...As a result, students can be expected to be treated differently on a campus from the way they would be treated in a business environment where customer satisfaction dictates all." (Giczkowski, W., 1990).

The Success Program at FDU has always offered credit for prior learning, day, evening and week-end class availability, advisement during day and evening hours twelve-months a year, classes with other adults, mail registration, an adult student newsletter, and an adult student oganization.

As a result of the Adult Learner Survey undertaken by the University Advisory Committee, we have initiated a university-wide adult student orientation and an adult student information center at each of the three campuses as of Fall 1990. We are also attempting to produce a university-wide student newsletter, "After Five" during this academic year.

## Conclusions

The analysis of all collected data are yet to be completed, however the initial analysis has given us a preliminary profile beyond that previously available and has provided the groundwork for implementation of policies/procedures to make FDU a more palatable environment for the non-traditional adult learner.

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# Identifying the Career Planning Needs of Community College Students: Undecided vs. Indecisive Students

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## INTRODUCTION

Career decisions are a central developmental issue for many college-age students; they can be particularly critical for community college students, who may be enrolled in programs designed to prepare them for immediate entry into an occupational field. Commitment to a career goal, or at least the sense of progress towards a goal, can be one factor influencing student persistence or decisions to leave college. In previous Massasoit studies, students withdrawing from the college frequently cited changes in career plans or uncertain educational goals as a principal reason for their decisions to leave school. Thus students' career decisions can impact both individual development and student retention, and providing students with the assistance they need in this area is an important component of institutional effectiveness.

This study grew out of the desires of Massasoit's Advisement and Counseling Center staff to develop better means of identifying students in need of career planning assistance and to improve services and delivery methods. Although the Advisement and Counseling Center offers a variety of career planning information and services, it has traditionally relied on students to seek out assistance when they feel the need for help. Many individual counseling appointments are devoted to career decision issues, and staff have offered a series of career planning workshops; but the feeling of counselors was that there are much larger numbers of students who would benefit from such support services. A proactive approach to identifying and contacting students appeared to be needed, as well as additional formats for career planning services. Institutional Research was asked to develop an instrument to help identify students in need of services.

Recent literature on career development among college age students has been characterized as presenting a "confusing, even contradictory, picture of career indecision" (Newman, Fuqua & Seaworth, 1989). There is agreement, however, on the complexity of the phenomenon. Studies explore such variables as anxiety (Hartman, Fuqua and Blum, 1985, 1988), locus of control (Hartman Fuqua & Hartman, 1983), feelings of self-efficacy (Taylor and Betz, 1983) and identity issues (Holland and Holland, 1977). Newman et al. suggest that some of the confusion in the literature stems from the practice in empirical studies of defining career indecision as a dichotomous variable. A number of authors have attempted to clarify this confusion by distinguishing between levels or types of indecision regarding career choice. Hartman et al. (1983) identified three types indecisiveness: acute-situational, which involves external barriers to decision; developmental, which remediates with time; and chronic indecisiveness, which is long-term. Hartman et al. (1985) suggest that developmental indecisiveness is situational, and open to informational approaches to remediation, while chronic indecision tends not to be resolved by these strategies. Kaplan and Brown (1987) make a useful distinction between the states of being *undecided*, whereby a person has the capacity to use information to make decisions but is waiting for an appropriate time to do so; and of being *indecisive*, unable to make decisions because of underlying psychological variables.

A variety of instruments are available to identify and categorize indecisiveness. The Career Decision Scale (CDS) developed by Osipow et al. (1976) appeared particularly

promising to Massasoit counselors for identifying students in need of services and providing data on the nature of those needs. The CDS is a short instrument, consisting of nineteen questions that use Likert-type response categories and takes 10-15 minutes to administer. However, before such an instrument could be practically utilized, a screening mechanism was needed to target students who might need assistance with career decisions for further assessment. Consequently, a question was developed for inclusion on an orientation questionnaire that uses response categories designed to distinguish the types of indecision suggested by Kaplan and Brown. This paper primarily concerns an analysis of responses to this question and others on the same questionnaire relating to career choice, and discusses characteristics associated with two of the groups that were identified: undecided and indecisive students.

## METHODS

For several years, background and educational planning information has been collected from entering Massasoit students at new student orientation sessions. A nationally published questionnaire (ACT/ASSET Educational Planning Form) was utilized; however, little subsequent use was made of the data collected. In 1988, the Office of Institutional Research was asked to develop an institutional form to replace the published form. A new question format was used to elicit responses regarding support service needs and a question asking students to characterize their current levels of career planning was added. The new question was aimed at identifying larger numbers of students who might benefit from services, but would not self-identify as being in need of help. It was developed with assistance from Advisement and Counseling Center staff, based on counseling experiences and recent literature on the career decision process. Response categories attempt to distinguish between undecided and indecisive students, who may have different support needs. The institutional questionnaire was revised in 1989; some question wording was changed and the visual format was significantly improved. Students complete the form at a new student testing and orientation session; forms are collected by orientation staff and forwarded to Institutional Research for analysis. Because questionnaire administration occurs in a structured situation, over 95% of students respond to most items.

Most of the data reported in this paper was collected from the Fall 1989 entering class of 2050 students. The group included first-time freshmen, transfers and students being re-admitted to the college after one or more semesters away. The entering student population was 50% female and 10% ethnic minorities, with 57% under the age of twenty, 28% twenty to twenty-five years, and 15% over age twenty-five. All were attending classes during the daytime and were matriculated in a degree program. About 60% were entering occupational programs and 40% programs designed to lead to transfer to four-year colleges. Three variables relating to the career decision process are the primary focus of this paper: the level of career planning characterized by responses to the above question; the specificity of student occupational goals; and the intent to seek help with career planning while enrolled at Massasoit.

## RESULTS

### Student Needs for Career Planning Services

Changes in the entering student questionnaire have resulted in significant increases in early identification of students needing career planning assistance. The first change, from the ACT to the institutional form, produced somewhat contradictory results. Although both forms asked students to check off a number of areas in which they "might need help", differences in question wording and response formats on the two made comparisons difficult. The subsequent revision of the institutional form provided more conclusive results. On the revised form, the question was changed to read as follows: "The college provides a number

of services to help students. Circle the letters of *all* of the following areas for which you plan to seek help.". The same areas for assistance were listed.

Students indicating an interest in help with educational planning increased from 15.6% to 21.7% with the revised form; the percentage indicating an intention to seek help with career planning increased from 22.6% to 44.2%, although these increases cannot be attributed to the change in wording alone. The larger numbers of students indicating an interest in career and educational planning services served as powerful evidence of the need to improve services and delivery methods. For the remainder of this discussion, attention will be focused on career rather than educational planning, since more students perceive this as a need, and intentions to seek this service were more clearly related to career decisiveness.

Students' likelihood of planning to seek career planning assistance was related to age, sex and ethnic background. Intentions to seek help increased slightly with age. White females were the group most likely to plan to use career planning services (47.1%); minority males were the least likely to plan to seek help (30.7%). White males (38.5%) and minority females (35.8%) were almost equally likely to intend to seek assistance. Ethnic differences were significant only for women ($p < .05$); sex differences were significant only for white students ($p < .001$). These differences in intentions to use services are disturbing when considered in light of some other indicators of apparent need which will be discussed below. Intentions to seek career planning assistance were not significantly related to whether students indicated a specific career choice but were related to how they characterized their current level of planning ($p < .001$).

### Levels of Career Decisiveness

Students were grouped by responses about their current level of career planning; categories parallel the types of indecision proposed by Kaplan and Brown (1987), with the addition of a "pre-decision" type for students who have not yet considered career planning issues. Response distribution for this question was as follows:

Circle the statement below that best describes your current planning:

| | | |
|---|---|---|
| I'm not very sure of myself and haven't thought much about goals or plans. (Pre-decision) | 90 | 4.6% |
| I've thought about my goals but making decisions is difficult for me. (Indecisive) | 524 | 26.6% |
| I don't have clear goals because I need more information. (Undecided) | 520 | 26.4% |
| I have a fairly clear picture of my goals and how to reach them. (Decided) | 835 | 42.4% |

Interestingly, the numbers of indecisive students enrolling varied significantly by orientation dates, with the largest percentages registering during the final orientation sessions in late August and early September.

The addition of this question proved valuable. It identified those who did not indicate their needs or intentions to seek help, but might nonetheless be in need of services, and provided data to assess the nature of career planning assistance that might benefit Massasoit students. A large number of students who did not indicate an interest in career planning assistance did characterize themselves as either indecisive or undecided regarding their goals and plans. In both years that the question was used, over 25% of the students surveyed did not indicate that they needed help with career planning but did characterize themselves as either undecided or indecisive regarding careers. Indecisive students were less

likely than those who characterized themselves as undecided to plan to use college services for help with career planning ($p<.01$).

On a related question that contributes insights on career decisiveness, students were asked to indicate their "career goal after you complete your education (occupation or type of work)". Sixty-nine percent of entering students listed an occupation in response to this question; this included many students from the indecisive and undecided groups discussed above. The breakdown of responses provided some evidence of concurrent validity for the question on levels of planning.

CAREER DECISIVENESS BY GOAL SPECIFICITY
(Row percentages)

| | No goal listed | Specific career goal |
|---|---|---|
| Pre--decision | 65.6 | 34.4 |
| Indecisive | 34.9 | 65.1 |
| Undecided | 52.1 | 47.9 |
| Decided | 10.7 | 89.3 |

**Program Enrollment Patterns**

The programs and courses in which students with career planning needs become important when designing services and delivery methods for providing assistance. Students in different types of programs varied significantly in both the specificity of their occupational goals and their decisiveness. The table below breaks down career decisiveness by program type.

CAREER DECISIVENESS BY PROGRAM TYPE
(Row percentages)

| PROGRAM TYPE | PRE-DECISION | INDECISIVE | UNDECIDED | DECIDED |
|---|---|---|---|---|
| Transfer | 5.1 | 30.4 | 30.9 | 33.6 |
| Business Career | 4.2 | 30.0 | 26.6 | 39.3 |
| Technical career | 2.2 | 21.1 | 27.6 | 49.2 |
| Health career | 2.1 | 7.7 | 9.8 | 80.4 |
| Service career | 1.8 | 23.2 | 19.9 | 55.1 |
| Developmental program | 17.9 | 26.3 | 33.7 | 22.1 |

Massasoit offers both the intensive developmental program (Latch) listed in the table above, which provides some career planning assistance as part of its curriculum, and a set of developmental basic skills courses in which students are placed through testing at orientations. Latch students are usually enrolled in at least one of these courses, but most students in developmental courses are not enrolled in Latch. In addition to the higher levels of indecision evidenced among Latch students, students identified as indecisive were more often placed in these pre--college level courses.

CAREER DECISIVENESS BY DEVELOPMENTAL COURSE PLACEMENTS
(Column percentages)

| | Number of Developmental Courses | | | |
|---|---|---|---|---|
| | None | One | Two | Three |
| Pre-decision | 3.2 | 5.8 | 7.6 | 6.3 |
| Indecisive | 22.6 | 29.9 | 33.9 | 38.8 |
| Undecided | 28.7 | 23.2 | 25.4 | 18.8 |
| Decided | 45.4 | 41.1 | 33.0 | 36.3 |

**Targeted Mailings for Career Decision Workshops**

In the first year of this study, students who identified themselves as either indecisive or undecided regarding career goals were sent targeted mailings inviting them to workshops focused on these issues. The indecisive students were invited to a workshop that stressed more general decision-making skills and explored the career decision process, while the undecided group were invited to a more informational session covering career planning resources. Attendance at both workshops was disappointing. Of 217 "indecisive" students who were contacted, only seven attended the workshop to which they were invited; eleven of 308 "undecided" students attended their workshop. Due to both the low attendance rate, and the large increase in the number of students in need of services (over 1000 in Fall 1989), targeting of individual students was judged not to be cost-effective, and the Advisement and Counseling Center has focused on classroom presentations on career decisions as its preferred strategy.

Group differences in Career Decisiveness

Responses regarding levels of planning and specific goals were analyzed in relation to a number of other variables , with particular attention to potential differences between indecisive and undecided students. A number of significant differences between these two groups emerged. Younger students and females were more likely to characterize themselves as indecisive; although sex differences took a different pattern for different age groups, as seen in the table below:

CAREER DECISIVENESS BY AGE AND GENDER
(Column percentages)

| | Under 20 | | 20-25 | | Over 25 | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| Pre-Decision | 6.2 | 3.6 | 4.4 | 4.6 | 3.5 | 3.6 |
| Indecisive | 29.3 | 35.5 | 18.9 | 27.4 | 16.3 | 10.2 |
| Undecided | 30.5 | 25.3 | 31.9 | 16.4 | 20.9 | 19.3 |
| Decided | 34.0 | 35.5 | 44.8 | 51.6 | 59.3 | 67.0 |

Sex differences in levels of career decisiveness were significant for students under 20 years ($p<.02$) and for those 20-25 years ($p<.001$), but not for those over 25 years of age. Age differences are significant for both sexes ($p<.01$).

Minority students, while almost as likely as white students to state that they had clear goals (38.1% vs. 42.8%), were more likely to be indecisive (38.1%) rather than undecided (19.3%) when their goals were not clear; the opposite was true of white students ($p<.005$). Sex differences in career decisiveness were significant only for white students, while ethnic

differences were significant only for men. Minority women's responses about their career decisiveness were more like those of white women than those of minority men.

CAREER DECISIVENESS BY GENDER AND ETHNICITY
(Column percentages)

| | Minority | | White | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Pre-decision | 5.8 | 3.3 | 5.1 | 3.8 |
| Indecisive | 39.5 | 36.7 | 23.2 | 27.7 |
| Undecided | 20.9 | 17.8 | 31.6 | 23.0 |
| Decided | 33.7 | 42.2 | 40.2 | 45.5 |

Differences between men and women, and white and minority students, were also apparent in the likelihood of having a specific occupational goal. Sex differences were significant for both white and minority students ($p<.001$); ethnic differences were significant only for men ($p<.0001$). Paradoxically, white women, the group most likely to state a specific occupational goal, were the most likely to plan to use career planning services, and minority men, most often undecided, were least likely to seek assistance in this area.

GOAL SPECIFICITY BY ETHNICITY AND GENDER
(Column percentages)

| | Minority | | White | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| Specific career goal | 49.7 | 67.1 | 67.7 | 73.0 |
| No goal listed | 50.3 | 32.9 | 32.3 | 27.0 |

## DISCUSSION

Data on the career planning needs of entering Massasoit students is consistent with a number of proposed theories of the career decision process. Responses to the question on career decision stages suggest that there are different groups of career undecided students with different support needs, as a number of authors have suggested. Groups that could be characterized according to Kaplan and Brown's distinction between "undecided" and "indecisive", or in terms of Hartman's "developmental" and "chronic" types of indecision, were identified.

There are a number of findings that suggest different support needs for these groups. Students in the undecided group, who perceive their needs as informational, are more likely to plan to seek assistance with career planning and are less likely to specify a specific occupational goal in the absence of that information, than are the indecisive students. This pattern suggests that they more often have the capacity to find and use the information that they need to arrive at a decision than do indecisive students, who were more likely to state a specific career goal although they they characterized themselves as having difficulty making decisions, and were less likely to plan to seek help. The contradictions in the responses of indecisive students would be consistent with Robbins (1987) discussion of career indecision from a self-psychology perspective, in which he notes that coherent and stable goals impact both the ability to form a plan of action for one's career and the effectiveness of information-oriented interventions.

Other findings of this study can be immediately useful in career planning curriculum and service development at Massasoit. To begin with, the large numbers of students who need assistance document the need to address career decision issues in a context other than

that of individual counseling. Program and course enrollment patterns of indecisive and undecided students suggest some possible strategies. The larger percentages of these students in transfer and business career programs would indicate that they are appropriate targets for services. In fact, a freshman seminar program that includes significant attention to the career decision process has been proposed for these two groups, and curriculum development is underway. This study supports the targeting of these programs, and suggests that career development components might include use of an instrument like the CDS to identify types of indecision, as well as using more informational approaches such as interest inventories. Classroom presentations on career planning in developmental courses would also be successful in reaching large numbers of indecisive students.

Age differences in students' levels of career indecision are not surprising, given that career choice is a normal developmental issue for traditional college-age students. But in this younger students, distinctions between undecided and indecisive may be less clear, and the higher numbers characterizing themselves as the latter misleading. Some authors have suggested that a diagnosis of chronic indecision should not even be attempted until the mid-twenties; although Hartman et al. (1983) suggest that early identification can be useful for preventative purposes, one goal of Massasoit counselors.

Gender and ethnic differences in career decisiveness are both more interesting and more disturbing than age differences. Interrelationships among these variables, along with goal specificity and intentions to seek help, are complex. Both women and minority students are more likely to be indecisive. But women are also more likely than men to be decided, indicate a specific occupational goal, and plan to seek assistance in planning careers. Minority men, conversely, are least likely to be decided, have a specific goal or plan to seek help. Theories of career development suggest some insights into these differences. Holland (1977, p.413) defines an "indecisive disposition" as follows: "This disposition is seen as the outcome of a life history in which a person has failed to acquire the necessary cultural involvement, self-confidence, tolerance of ambiguity, sense of identity, and environmental knowledge to cope with vocational decision making as well as with other common problems." This definition has implications for both women and members of minority groups. As "outsiders" to the dominant culture, the cultural involvement Holland considers necessary is to some degree blocked to them; lacking this opportunity, other important factors may also fail to develop. Even those who are successful in becoming involved in the dominant culture may find that it offers them few rewards that behaviors that for others lead to feelings of self-efficacy and confidence for them lead to frustration and feelings of exclusion.

The literature on career development is particularly lacking in both theoretical articles and empirical studies that focus on the career decision process for minorities and could provide some insight in examining the Massasoit data. In a comprehensive review of recent literature in the field, which covered 124 articles drawn from seven journals and the ERIC database, Savickas (1989) cites only *one* study that focused on minority subjects -- a study of career decision interventions with Puerto Rican women. In contrast, the same review discusses a large body of research dealing with women's career decisions, including studies of sex-stereotyping of occupations among various age groups and populations, and the effectiveness of different intervention strategies.

For minority men, the implications of the data discussed here are disturbing. While Women, including minority women, appear to be able to use some obstacles or limitations to career development to peculiar advantage. Although sex-stereotyping may constrict the range of potential occupational choices, it does provide them with clear guidelines as to which choices are appropriate. Indeed, the career goals of both Massasoit men and women are highly sex-stereotyped, with women choosing from fewer occupations. Thus the higher numbers of women who consider themselves to be "decided" about their career plans may not be an entirely positive finding, and the higher levels of indecision expressed may reflect their discomfort with the situation and the feeling that more information will not address their problems. In addition, the greater acceptability of help-seeking behavior for women

makes them more likely to find the assistance they need in resolving career development issues.

Minority male students face a different dilemma, with fewer apparent mechanisms for resolving career indecision. Their exclusion from the occupational structure of the dominant culture is not counterbalanced by the simple "solution" that sex-stereotyping offers to women. Moreover, as men, the help-seeking strategies that might lead to successful career decisions are less gender-appropriate. The situation of career-indecisive minority males could be seen more as the acute-situational type proposed by Hartman et al., involving external sociological barriers to decision rather than underlying psychological factors or developmental issues. Like women, the tendency of minority males to not view information as enhancing their ability to make a decision is based in part in reality. Although their higher levels of indecision could well be influenced by lower feelings of self-efficacy reported in the research, it is also an accurate assessment of the situation that faces them.

## CONCLUSIONS

Review and revision of a student questionnaire, with input from end-users of information, dramatically improved the accuracy and utility of data collected from entering students, and provided new insights into their needs. Analysis of responses to questions on career goals and decisiveness suggests that Massasoit counselors are correct in distinguishing between undecided and indecisive students, and that services and delivery methods should be somewhat different for the two groups. While the two groups share some needs for further information and support, the sources of their indecision include different factors. Their ability to develop and commit themselves to career goals will be impacted by the kind of help they receive while at the college. Undecided students have the ability to benefit from the kinds of short-term information-oriented interventions that are currently offered, and are more likely to seek and use these services; improvements are needed primarily in increasing the numbers of students who can be served. But helping indecisive students presents more of a challenge to counseling personnel and resources. Active outreach is clearly indicated, since students are less likely to seek help on their own. Interventions that include some mechanism for diagnosing the nature of indecision in individuals and referral to appropriate sources of assistance, along with more general information on the career decision process, are most likely to be effective.

The current emphasis on career planning presentations in the classroom should be expanded, perhaps targeting more students in developmental courses, and include some further assessment of students' decision-making abilities. The freshman seminar program being developed could be an important early intervention for both undecided and indecisive students, providing information on the career decision process and identifying students with chronic indecision for further assistance. Finally, the needs of women and minorities should receive particular attention as both curriculum and intervention strategies are developed, as these groups are becoming a growing majority of Massasoit students.

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# A COMPARISON OF EXIT AND RETROSPECTIVE SURVEYS

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In a review of theoretical and methodological research on reasons for student attrition, Gilbert and Gomme (1968) indicated that pre-enrollment traits are less important predictors of retention than experiences in college and that high levels of social and academic interaction and commitment to the institution predict persistence, consistent with the model proposed by Tinto (1975, 1982) and supported by research by Pascarella and colleagues (Terenzini, Pascarella, Theophilides, & Lorang, 1985; Pascarella, Duby, & Iverson, 1983). More recently, Tinto (1987, 1988) argued that college entrance and subsequent withdrawal are a longitudinal process that occurs in stages and that reasons for leaving probably vary with those stages. Institutions must address different problems at different stages of transition to reduce attrition. Thus, retention research is beginning to grapple with the complexity of the decision-making process that leads students to depart from a given institution.

Because of the difficulty of measuring conceptual variables such as integration into the academic community, institutional researchers often conduct post-hoc studies asking students about their reasons for withdrawing from an institution. While this is a logical way to begin to study student attrition at a given institution, Braxton, Brier, and Hossler (1988) suggested that data from post-hoc studies should be used cautiously. Such studies tend to be descriptive and atheoretical, often even lacking comparison groups of retained students (Terenzini, 1982). Furthermore, students may give reasons for withdrawal that are socially acceptable rationalizations. When theoretical constructs such as goal commitment, integration, and background characteristics were measured along with perceived problems, such as difficulty in obtaining desired courses, financial problems, and personal problems, Braxton et al. found that reported problems were not important factors accounting for student withdrawal. This contradicts previous research indicating that dissatisfaction does relate to withdrawal, at least in some samples of students (Bean, 1980; Lenning, Sauer, & Beal, 1980).

Braxton et al. (1988) proposed four explanations for the failure of reported problems to account for withdrawal: students may not be aware of their reasons; students are unable to verbalize lack of integration and other abstract concepts; students may be unwilling to admit lack of integration because it is socially unacceptable; and students may not wish to criticize the institution. However, their study could not identify which explanation is most likely.

In this paper we propose that the process of understanding an important life experience is also complex and that self-reports from students reflect a stage in respondents' own cognitive processing of why they took a particular course of action. As people explain events in their lives they often "try out" various attributions (Janoff-Bulman & Frieze, 1983; Taylor, 1983). It seems possible that the timing of exit interviews may affect the nature of students' responses. Surveys completed at the



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time a student is withdrawing may be influenced by social desirability and rationalization, since students may still be trying to justify a decision to themselves. Surveys completed after some time may be more introspective, in that students may have had time to contemplate their college experience, have had other experiences with which help them gain perspective, and do not feel their self-esteem is at stake by giving less socially desirable answers, particularly if the interview is nonthreatening (Tinto, 1987). In addition, they may no longer feel a part of the college community and have less reason to be reluctant to criticize the institution or other students there. Thus, students may give different reasons for leaving two or three years after withdrawal than they did at the time of leaving.

This report is a comparison of responses to two different kinds of surveys of students at a rural liberal arts college with an enrollment of 1100 students. One study involved exit interviews conducted at the time that students indicated their intention to withdraw from the college; the other study was a telephone survey conducted about two years after students' withdrawal from the college.

## Method

### Study 1

Between November 1987 and May 1988, exit interviews were conducted with 101 students who were withdrawing from the college. When students contacted the academic advising office to complete the paperwork for withdrawing from the college, they were scheduled for required interviews. Since some students never completed withdrawal paperwork and others missed their interview appointments, 69 percent of the students who withdrew from the college during that time were interviewed.

Interviews were conducted by ten staff people representing the academic advising office, the academic division directors, the dean of students office, admissions, and the president's office. The interview, which took an average of 45 minutes to complete, included a variety of structured and open-ended questions about students' plans, reasons for leaving, and satisfaction and dissatisfaction with academic and student life programs of the college. Questions of importance to this report were a rank ordering of reasons for leaving the college, questions about intentions to transfer with choices to check, and satisfaction ratings on 10-point scales of thirty college departments and aspects of college life.

### Study 2

The second study involved telephone interviews with students who matriculated at the college in 1984 which were conducted during the spring and early summer of 1988. The purpose was to compare the responses of students who had graduated from the college in 1988 with students who had withdrawn before graduation. However, in this report, we are interested in comparing the responses of the withdrawn students to those of exit interviewees in Study 1.

The nongraduate sample consisted of alternate names on an alphabetical list of students who had not graduated in 1988. The telephoners, an admissions staff member and two students, attempted to contact every student in the sample. When respondents were available, interviews were conducted at that time; otherwise they were called back at a later date.



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Current phone numbers were obtained if students were no longer living at the number on record and the students were called immediately at their current phone number. Most calling was done between 5 and 8 p.m. on weekdays, though some calls were made during daytime and Saturdays. Forty-seven nongraduates were reached by telephone; only one refused to participate. Therefore, there were 46 respondents, representing 15 percent of the total population of nongraduates among 1984 matriculants.

The graduate sample consisted of a list of the 94 students who had graduated from the college in four years. There were 48 graduate respondents, representing 51 percent of the population of graduates.

The interview had a structured format with both open-ended questions and questions with response choices or scales. By design, several questions were identical to questions on the exit interview in Study 1, thus permitting a comparison of the responses in the two study methods. Specifically, questions regarding reasons for leaving, intentions of tranferring elsewhere, and satisfaction with college programs and life were the same.

Comparison of Samples

The two samples represent similar, but not identical, cohorts at this college. The exit interview respondents matriculated between 1984 and 1988; the survey respondents all matriculated in 1984. Although admissions data suggest that the characteristics of matriculants at the college did not change on any measurable characteristics during those years, any changes in college programs and facilities would certainly have influenced results.

The exit interview respondents were more likely to be self-selected, since they had to contact academic advising to declare their intention to leave and then keep an appointment with an interviewer. We speculate that students willing to be interviewed may be more inclined to feel positively about the college and have less negative reasons for leaving the college than students who chose not to be interviewed. Indeed, that was one of the reasons for doing the second study. However, since colleges often use exit interviews to obtain information from withdrawing students, we feel it is useful to compare the kinds of information received on exit interviews to the kinds of information received from the retrospective survey to qualify exit interview findings appropriately.

Comparison of Results

Many similar issues were raised in the exit interviews and the survey, but the emphasis differed from one method to the other. Regarding reasons for leaving the college, on the exit interviews financial reasons and the rural location of the college were regarded as more important than on the surveys. On the survey, lack of facilities and alcohol and drug use were regarded as more important than in the exit interviews.

Regarding intentions to transfer, a smaller number of survey respondents had actually transferred than the number who said they intended to in exit interviews (73% vs. 83%). However, another 23 percent on the surveys said they still intended to return to school. Also, the number who had transferred at the time of the survey (73%) is comparable to the number who had actually applied to transfer at the time of their exit interview (67%). The characteristics of the institutions to which exit interviewees

intended to transfer were similar to those actually attended by survey respondents, that is, predominantly urban, public, and residential colleges.

In ratings of satisfaction with college programs, the food service, facilities, social activities, and faculty advising were mentioned among the most negative items by both survey respondents and exit interviewees. However, exit interviewees also mentioned dorm life, the environment and physical location, the small size of the college, the library, and other students as very negative, whereas survey respondents mentioned the dining commons, career development services, availability of jobs while in college, the strictness of rules, and admissions standards as negative. Thus, both groups emphasized negative perceptions of nonacademic areas, but focused on slightly different factors. (See Table 1.)

Table 1: Satisfaction ratings obtained during two kinds of interviews.

| Items Evaluated Negatively | | |
|---|---|---|
| Exit Interviews | Telephone Survey | Both |
| dorm life environment | dining commons | food service |
| physical location | career services | facilities |
| size of college | jobs in college | social activities |
| library | strictness of rules | faculty advising |
| other students | admissions standards | |

| Items Evaluated Positively | | |
|---|---|---|
| Exit Interviews | Telephone Survey | Both |
| dorm life | peer advising | faculty members |
| intramural recreation | classroom and labs | orientation |
| | library | quality of faculty |
| | | social atmosphere |
| | | size of college |
| | | physical environment |

## Discussion

Both studies showed that students were positive about interaction with faculty members, freshman orientation, the quality of the faculty, the social atmosphere, the size of the college, and the environment and physical location. The exit interviewees were also positive about dorm life and the intramural sports program; the survey respondents were also positive about peer advising, classroom and lab facilities, and the library.

As an aside, it is interesting that physical environment and dorm life were among the most positive and the most negative factors on exit interviews. Clearly there is not much consensus on these issues. In fact some interviewees listed them as both positive and negative, citing difference aspects of each as positive and negative. The college's idyllic rural environment also created feelings of isolation; the dorm life was regarded as fun, but other people's fun sometimes was intrusive.

Thus, students gave slightly different responses for withdrawing when interviewed at different points in time. Financial reasons and the rural location may be easier factors to talk about to an interviewer face-to-face (or even to admit to oneself) than boredom and alcohol and drug use. Students' actual behavior since leaving suggests that transfer rate is better indicated by actual application to colleges reported during exit interviews, rather than by intention to transfer.

Discussing dissatisfactions, the exit interviewees focused on physical features of the college; the survey respondents tended to focus on programs and policies. It may be easier to talk about physical characteristics which cannot easily be changed than to place blame on specific departments in an interview setting. The survey respondents were most positive about facilities. Perhaps having gone elsewhere and gaining a basis for comparison inclined them to be more forgiving of perceived problems with facilities. The exit interviewees were most positive about social life on campus. Since leaving friends is a difficult part of transition, social benefits may be especially salient at the time of withdrawal, rather than college programs or policies. Later on, respondents may feel freer to judge their own or other people's behavior more critically. Perhaps we can extend Tinto's (1967, 1968) model of withdrawal as a developmental process to include the idea that explaining one's decision to leave a college also may involve a longitudinal shift in perceptions.

Despite Tinto's (1967) assertion that people who have already left or are leaving are more willing to be honest about the institution than those who are currently enrolled, people undoubtedly have multiple reasons for any decision in life, so differences in responses from the two methods may reflect different emphases at the two times, not respondents' dishonesty. Similarly, ratings of satisfaction may change as students mature and gain more experience at other schools.

It is important to acknowledge that there were other differences between these two studies that probably contributed to the differences in findings. The exit interviews were conducted face-to-face, but the survey was conducted by telephone; respondents may feel more anonymous and therefore freer to be honest in a telephone interview. In addition, some of the survey interviews were conducted by students, who may also elicit more honest answers if respondents suspect that they are more aware of the day-to-day activities of student life than staff or faculty members. Indeed, Tinto, (1967) argued that trained student interviewers may be more effective than staff or faculty for precisely that reason. Since the research was conducted for the purpose of institutional program review, rather than explicitly to compare the two types of interviews, these factors were not controlled systematically. A more careful controlled comparison would identify whether these factors contributed to the differences in the responses. Finally, Braxton et al.'s (1988) warning that reported dissatisfactions may not be reasons for withdrawal is worth repeating here: changing areas of dissatisfaction may not improve retention. Students may be unable to articulate more important conceptual phenomena such as integration into the campus community.

However, interviews with withdrawn students may also have other uses. Ramist (1981) argued that exit interview should always be conducted, including surveys of students who withdraw between terms, to assess changes in perceptions of the institution and increase the probability of reenrollment by students on temporary leave. Tinto (1987) maintained that retention assessment both describes what types of departures occur and explains events leading to departure in various groups. Institutions are, we hope, always trying to improve services and we believe that both immediate perceptions such as exit interviews and retrospective evalutions such as survey responses may provide useful information. In future research, it may be important to examine whether perceptions obtained a year or two after students have withdrawn may be better indicators of areas which could be improved to enhance retention of students. In the meantime, institutional researchers should be aware of tendencies to different responses at various points after withdrawal from a college.

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# Developing Measures of Academic and Administrative Productivity During a Time of Budget Recision

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Consider the following set of circumstances which are converging on altogether too many institutions of higher education and with alarming frequency as we enter the decade of the 1990's:

1. Significant numbers of tenured faculty in programs with decreasing student demand

2. Professional staffs whose numbers exceed that of the faculty

3. Deferred maintenance practices over the years which have resulted in serious erosion of the campus infrastructure

4. Annual tuition increases which substantially outstrip the rate of inflation

Sound familiar? The simple fact of the matter is that colleges and universities coasted through the halcyon days of the 1970's and early 1980's adding programs, personnel, and facilities in response to burgeoning student enrollments with little, if any attention paid to strategic planning and cost containment. As the late 1980's brought a thundering crash to enrollment prosperity, many institutions do indeed find themselves overstaffed, overbudgeted, and underfunded in the face of declining tuition revenues. The call for serious planning activity in higher education has been long-standing: Richard Cyert, currently President of Carnegie-Mellon University, authored a paper in 1978 on "The management of universities of constant or decreasing size." George Keller's (1983) book entitled Academic Strategy: The Management Revolution in Higher Education, eloquently called for monitoring the organizational environment in which higher education institutions operate, and for establishment of appropriate planning structures and processes to respond to environmental constraints upon the colleges and universities. More recently, William Massy (1989, 1990), Vice President for Business and Finance at Stanford University, has argued persuasively for cost-containment in higher education and for more effective assessment of productivity in both academic and administrative arenas of operation.

The purpose of this paper is to build upon the directives articulated by these leaders in higher education, as well as by others. The role of institutional research in the budget process at the University of Delaware is purely one of data support. That is, the Office of Institutional Research and Planning provides appropriate information for describing the current position of academic and administrative units with respect to fiscal health and productivity; it does not prescribe strategic directions in light of that information. The latter function is, and rightfully so, the domain of academic deans and chairs and administrative vice presidents. Institutional Research and Planning's role, however, is no less crucial. In order for effective strategic direction to evolve, it must do so from a base of information that is as accurate and as richly textured as possible. This paper will describe how the Office of Institutional Research and Planning at the University of Delaware provides that richness of texture in academic and administrative budget support data.

ACADEMIC ANALYSIS

A discrete set of fiscal and productivity measures have been developed and assembled into budget support packets for academic units at the University of Delaware. One such packet is found in Appendix A to this paper. As noted above, the task of institutional research in the budget planning process is to accurately depict current measures of fiscal health and productivity, and to provide a historical context for viewing the numbers to determine how they fit with respect to trend data.

To achieve this objective, the Office of Institutional Research and Planning has created data sets for three fiscal years, i.e., the current fiscal year and its two predecessors. Within those three years, budget support data have been developed consisting of three components: a) an analysis of instructional workload; b) a detailed analysis of revenues by fund type, and a companion detailed analysis of expenditures by fund type and function; and, c) a summary of employees, by personnel category, budgeted to the respective units during the current fiscal year.

In analyzing instructional workload, the Office of Institutional Research and Planning has pulled together specific measures of workload productivity and has tied them together in a series of management ratios. Those productivity measures and accompanying ratios consist of the following:

1. **FTE Majors:** Full time equivalent (FTE) majors are calculated by taking the total number of part time students and dividing that number by 3, and subsequently adding that quotient to the total number of full time students.

2. **Student Credit Hours:** Student credit hours are displayed for lower division, upper division, and graduate levels of

instruction in both regular courses and in supervised study. The data reflect student credit hour counts by origin of course. That is, they reflect all credit hours taught in a given academic department, regardless of the "home department" of the instructor.

3. **FTE Students Taught:** In a concept different from FTE majors for a given department, FTE students taught within that department are calculated by converting student credit hours to FTE students in order to provide a measure of workload demand, including that generated by service to non-majors, within a given department. National norms for this calculation assume that a full time undergraduate consumes 15 credit hours per semester on average, while graduate students consume 12 hours. The 15 and 12 become the respective divisors for undergraduate and graduate student credit hours arrayed in the preceding section. A number of department chairs at the University of Delaware argue that 9 would be a more appropriate divisor for graduate students, particularly in largely research-oriented departments. This is not an argument without merit. Institutional Research and Planning, however, has opted to retain the divisor of 12 for compatibility with other universities.

4. **FTE Faculty:** FTE faculty on appointment are derived directly from standard University production reports. However, in accurately portraying the total instructional activity of a given department, it is important to capture the "FTEness" of supplemental faculty who do not teach on regular appointment or who teach for extra pay. These faculty are computed by totalling the teaching credit hours (i.e., credit value of a given course) for all instructors who are not on regular faculty appointment, as well as the total teaching credit hours for courses taught by regular faculty on an overload or supplemental pay basis. Each 12 teaching credit hours per semester (which equates to the administered load within the collective bargaining agreement) constitute one supplemental FTE faculty.

5. **Workload Ratios:** Student Credit Hours/FTE Faculty and FTE Students Taught/FTE Faculty are straightforward expressions of mathematical relationships between the data elements described above. A separate ratio, "Teaching Credit Hours/FTE Faculty on Appointment" is also provided for informational purposes. Assuming the average University course has a credit hour value of 3, the Teaching Credit Hour/FTE Faculty ratio can be viewed as an expression of the average number of courses being taught each semester by faculty on appointment..

6. **On-Load/Off-Load Data:** It is useful to know the proportion of total student credit hours consumed in a given department that are taken in courses taught by faculty on appointment as part of the administered load, and the proportion of credit hours taken in courses taught by supplemental faculty outside the administered load.

7. **External Funding Data:** Externally sponsored research and public service activity in a given department may be viewed as a "quid pro quo" for reduced teaching loads. Data for each of these categories is provided from the final year end budget close for each respective fiscal year. Each category of external funding has also been cast into a ratio expressing external support/FTE faculty.

8. **Income and Expense Ratios:** Instructional costs are displayed which represent total expenditures for instruction within a given unit as extracted from appropriate account codes within the University Accounting File. The total instructional cost was then divided by student credit hours and by FTE students taught to arrive at two ratios: instructional cost/student credit hour and instructional cost/FTE student taught. Two additional financial measures were calculated: tuition revenue and earned income. Tuition revenue represents revenues generated through tuition paid by FTE majors. It was calculated by developing a composite full time tuition rate reflective of the resident/non-resident split at the University, and multiplying that full time tuition rate by FTE majors. Earned income, on the other hand, represents tuition revenues generated from instruction within a given academic unit. It was calculated by developing a composite per-student credit hour charge, again reflective of the resident/non-resident split, and multiplying that charge by the number of credit hours taught within that academic unit. Having developed a figure for earned income, it is then possible to cast it against the total instructional cost data to arrive at an earned income/total instructional cost ratio. A ratio in excess of 1.0 indicates a net "profit"; a ratio less than 1.0 indicates a net "loss".

9. **Financial Data:** As back-up for the fiscal data used in the various ratios described above, units are provided with detailed summaries of revenues and expenditures by fund type and by function for the three most recent fiscal years. Fund types refer to standard fund type categories: basic, self-supporting, allocated, and restricted funds. Functions include instruction, departmental research, organized activities within educational departments, externally sponsored research, public service, academic support, and "other".

10. **Personnel Data:** Data are provided for positions budgeted to a given academic units, and include the following descriptors: a) account code from which the salary is paid; b) job title; c) annual salary rate; d) total FTE associated with position; e) tenure or contract date; f) years with University; f) years in current job title; g) percent FTE associated with account code; h) salary distribution across fund types.

ADMINISTRATIVE ANALYSIS

The process which lead to the development of the budget support packets for the academic units provided a analytical

framework for measuring current financial position and productivity. We then asked curselves, "could this framework be applied to administrative units?" After extensive review of unit operations and account structure, we concluded that the analytical framework--applied to academic units--could also be applied to administrative units to develop a financial profile. However, this framework could not be applied to develop measures of fiscal health nor to develop measures of productivity. As a result, our budget support packet consisted of a financial profile; there were no measures of fiscal health or productivity. One such packet is found in Appendix B to this paper.

Three data sets were created for three fiscal years: the current fiscal year and its two predecessors. Within those three years, budget support data have been developed consisting of two components: a) a detailed analysis of revenues by fund type, and a companion detailed analysis of expenditures by fund type and function; and, b) a summary of employees, by personnel category, budgeted to the respective units during the current fiscal year. The budget support data for our administrative units were as follows:

1. **Financial Data**: Units were provided with detailed summaries of revenues and expenditures by fund type and by function for the three most recent fiscal years. Fund types refer to standard fund type categories: basic, self-supporting, allocated, and restricted funds. Functions include instruction, departmental research, organized activities within educational departments, externally sponsored research, public service, academic support, and "other."

2. **Personnel Data**: Data are provided for positions budgeted to a given administrative unit, and include the following descriptors: a) account code from which the salary is paid; b) job title; c) annual salary rate; d) total FTE associated with position; e) tenure or contract date; f) years with University; f) years in current job title; g) percent FTE associated with account code; h) salary distribution across fund types.

As stated earlier, this analysis clearly lacked the measures of workload which existed in the analysis of academic units and, therefore, lacked the management ratios which provided measures of current financial position and productivity. For example, we attempted to rank order units according to expenditure growth but we lacked the baseline measure to determine how much growth is due to increased workload and how much growth is due to unit layering. That is, how much growth is justifiable? Also, measuring the workload of the Treasurer's Office (transaction-oriented) required one set of analytical tools while measuring the workload of the Office of Employee Relations (people oriented) required a second set.

The lack of an analytical framework to measure the workload of administrative units, due primarily to the diversity of their

inputs, resulted in a budget support packet rich in financial data, but poor in measures of workload and, therefore, poor in measures of productivity. Nevertheless, the budget support packet was useful as a disseminator of current and historical financial data for administrative vice presidents.

## Conclusion

The call for cost-containment and more effective assessment of productivity, in both academic and administrative arenas of operation, rang loud and clear throughout the corridors of the University of Delaware. The Office of Institutional Research, we believe, answered the call--within its role of data support--by recognizing the need for a base of information that is accurate and richly textured and by assembling that information into a packet of budget support data.

We recognize, however, when weighing the merits of budget support data for academic units and administrative units: the scale tips heavily in the direction of the support data for academic units. Hence, as the University of Delaware enters a new fiscal year, the Office of Institutional Research must continue to answer the "call" by doing two things: 1) refine the existing measures of fiscal health and productivity for academic units and, 2) construct a analytical framework to develop measures of administrative workload. We have begun this process using William F. Massey's (1989) paper entitled "Productivity Improvement Strategies For College and University Administration and Support Services" as our theoretical backdrop.

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Appendix A Follows

AN ANALYSIS of INSTRUCTIONAL WORKLOAD: FALL and SPRING SEMESTERS,
1987-88 thru 1989-90

DEPARTMENT/UNIT:

| | FALL 1987 | FALL 1988 | FALL 1989 | SPRING 1988 | SPRING 1989 | SPRING 1990 | ANNUAL AVERAGE 1987-88 | ANNUAL AVERAGE 1988-89 | ANNUAL AVERAGE 1989-90 |
|---|---|---|---|---|---|---|---|---|---|
| FTE MAJORS | | | | | | | | | |
| Undergraduate | 261 | 245 | 244 | 212 | 198 | 222 | 237 | 222 | 233 |
| Graduate | 80 | 93 | 88 | 77 | 89 | 86 | 79 | 91 | 87 |
| TOTAL | 341 | 338 | 332 | 289 | 287 | 308 | 315 | 313 | 320 |
| STUDENT CREDIT HOURS | | | | | | | | | |
| Lower Division | 198 | 180 | 203 | 371 | 243 | 222 | 285 | 212 | 213 |
| Upper Division | 562 | 581 | 427 | 517 | 637 | 630 | 540 | 609 | 529 |
| Graduate | 761 | 1,042 | 873 | 757 | 915 | 958 | 759 | 979 | 916 |
| TOTAL | 1,521 | 1,803 | 1,503 | 1,645 | 1,795 | 1,810 | 1,583 | 1,799 | 1,657 |
| FTE STUDENTS TAUGHT | | | | | | | | | |
| Lower Division | 13.2 | 12.0 | 13.5 | 24.7 | 16.2 | 14.8 | 19.0 | 14.1 | 14.2 |
| Upper Division | 37.5 | 38.7 | 28.5 | 34.5 | 42.5 | 42.0 | 36.0 | 40.6 | 35.2 |
| Graduate | 63.4 | 86.8 | 72.8 | 63.1 | 76.3 | 79.8 | 63.3 | 81.5 | 76.3 |
| TOTAL | 114.1 | 137.6 | 114.8 | 122.3 | 134.9 | 136.6 | 118.2 | 136.2 | 125.7 |
| FTE FACULTY | | | | | | | | | |
| FTE Faculty On Appointment | 19.7 | 18.8 | 21.5 | 17.7 | 19.4 | 19.0 | 18.7 | 19.1 | 20.3 |
| Supplemental FTE Faculty | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.6 | 0.5 | 0.6 |
| TOTAL | 20.3 | 19.3 | 22.1 | 18.2 | 19.9 | 19.5 | 19.2 | 19.6 | 20.8 |

NOTE: "FTE Faculty on Appointment" data are taken directly from UPS 603 Report for respective semesters from Fall 1987 through Spring 1990. "Supplemental FTE Faculty" data for 1989-90 are computed averages from actual data for the preceding two years, as extracted from the AAR data base.

AN ANALYSIS of INSTRUCTIONAL WORKLOAD: FALL and SPRING SEMESTERS,
19[illegible] 88 thru 1989-90

DEPARTMENT/UNIT:

| WORKLOAD RATIOS | FALL 1987 | FALL 1988 | FALL 1989 | SPRING 1988 | SPRING 1989 | SPRING 1990 | ANNUAL AVERAGE 1987-88 | ANNUAL AVERAGE 1988-89 | ANNUAL AVERAGE 1989-90 |
|---|---|---|---|---|---|---|---|---|---|
| Student Credit Hours/ FTE Faculty | 75.1 | 93.3 | 68.1 | 90.2 | 90.3 | 92.6 | 82.6 | 91.8 | 80.3 |
| FTE Students/FTE Faculty | 5.6 | 7.1 | 5.2 | 6.7 | 6.8 | 7.0 | 6.2 | 7.0 | 6.1 |
| Teaching Credit Hours/ FTE Faculty on Appointment | 2.7 | 2.7 | 2.7 | 2.9 | 3.0 | 3.0 | 2.8 | 2.9 | 2.8 |

NOTE: Teaching Credit Hours/FTE Faculty on Appointment for 1989-90 is an estimate based upon average for preceeding two years.

| ON-LOAD/OFF-LOAD DATA | 1987-88 | 1988-89 | 1989-90 |
|---|---|---|---|
| Total Student Credit Hours Taught On-Load | 3,244 | 3,818 | 0 |
| Total Student Credit Hours Taught by Supplemental Personnel and Faculty Overload | 379 | 375 | 0 |

| EXTERNAL FUNDING DATA | 1987-88 | 1988-89 | 1989-90 |
|---|---|---|---|
| Externally Sponsored Research | $2,161,062 | $2,498,948 | $3,083,469 |
| Externally Sponsored Public Service | $0 | $0 | $0 |
| TOTAL EXTERNAL SUPPORT | $2,161,062 | $2,498,948 | $3,083,469 |
| External Funding/FTE Faculty On Appointment | $115,782 | $131,110 | $152,270 |

AN ANALYSIS of INSTRUCTIONAL WORKLOAD: FALL and SPRING SEMESTERS,
1987-88 thru 1989-90

DEPARTMENT/UNIT:

| INCOME and EXPENSE RATIOS | 1987-88 | 1988-89 | 1989-90 |
|---|---|---|---|
| Total Instructional Costs | $2,383,991 | $2,235,663 | $2,727,369 |
| Total Instructional Cost/Student Credit Hour | $753 | $621 | $823 |
| Total Instructional Cost/FTE Student | $20,172 | $16,410 | $21,699 |

NOTE: Total Instructional Costs consist of TOTAL EXPENDITURES (excluding Information Processing) for INSTRUCTION (functions 01 thru 08) from the expenditure data attached

| | | | |
|---|---|---|---|
| Tuition Revenue (composite full-time tuition rate multiplied by FTE MAJORS) | $1,396,710 | $1,501,250 | $1,681,280 |
| Earned Income (composite per credit hour tuition rate multiplied by Student Credit Hours) | $682,862 | $860,188 | $880,833 |
| Earned Income/Total Instructional Costs | 0.29 | 0.38 | 0.32 |

DEPARTMENT:
FISCAL YEAR: 1989-90

| | FUND-TYPE | | RESTRICTED | | |
|---|---|---|---|---|---|
| | BASIC | SELF-SUPPORTING | FEDERAL (03-X) | OTHER (04-X) | GRAND TOTAL |
| REVENUES | | | | | |
| TUITION & FEES | 0 | 0 | 0 | 0 | 0 |
| GOVERNMENT APPROPRIATIONS | 0 | 0 | 1,134,411 | 10,000 | 1,144,411 |
| NON-GOVERNMENT CONTRACTS & GRANTS | 0 | 0 | 0 | 953,094 | 953,094 |
| ENDOWMENT | 0 | 0 | 0 | 8,432 | 8,432 |
| INCOME FROM TEMPORARY INVESTMENTS | 0 | 0 | 0 | 77,781 | 77,781 |
| GIFTS | 0 | 0 | 0 | 839,157 | 839,157 |
| OTHER | 0 | 280 | 0 | 6,402 | 6,682 |
| TOTAL REVENUES | 0 | 280 | 1,134,411 | 1,894,866 | 3,029,557 |

DEPARTMENT:
FISCAL YEAR: 1988-89

| | FUND-TYPE | | RESTRICTED | | |
|---|---|---|---|---|---|
| | BASIC | SELF-SUPPORTING | FEDERAL (03-X) | OTHER (04-X) | GRAND TOTAL |
| REVENUES | | | | | |
| TUITION & FEES | 0 | 0 | 0 | 0 | 0 |
| GOVERNMENT APPROPRIATIONS | 0 | 0 | 908,974 | 0 | 908,974 |
| NON-GOVERNMENT CONTRACTS & GRANTS | 0 | 0 | 0 | 763,634 | 763,634 |
| ENDOWMENT | 0 | 0 | 0 | 5,339 | 5,339 |
| INCOME FROM TEMPORARY INVESTMENTS | 0 | 0 | 0 | 81,675 | 81,675 |
| GIFTS | 0 | 0 | 0 | 614,505 | 614,505 |
| OTHER | 0 | 5,213 | 0 | 0 | 5,213 |
| TOTAL REVENUES | 0 | 5,213 | 908,974 | 1,465,153 | 2,379,340 |

DEPARTMENT:
FISCAL YEAR: 1988-89

| | INSTRUCTION (01 - 08) | DEPARTMENTAL RESEARCH (09) | ORG ACTIVITY EDUC DEPTS (10) | RESEARCH (21 - 39) | PUBLIC SERVICE (41 - 43) | ACADEMIC SUPPORT (51 - 56) | OTHER (61 - 99) | GRAND TOTAL |
|---|---|---|---|---|---|---|---|---|
| EXPENDITURES | | | | | | | | |
| SALARIES | | | | | | | | |
| PROFESSIONALS | 134,691 | 0 | 0 | 45,374 | 0 | 0 | 0 | 180,065 |
| FACULTY | | | | | | | | |
| FULL-TIME (INCLUDING DEPT CHAIR) | 1,178,596 | 2,977 | 0 | 26,441 | 0 | 0 | 0 | 1,208,014 |
| PART-TIME/OTHER (INCLUDING OVERLOAD) | 19,218 | 9,489 | 0 | 158,530 | 0 | 0 | 0 | 187,237 |
| GRADUATE STUDENTS | 176,936 | 38,612 | 0 | 566,587 | 0 | 0 | 76,342 | 858,477 |
| POST DOCTORAL FELLOWS | 19,465 | 0 | 0 | 154,306 | 0 | 0 | 0 | 173,771 |
| TUITION/SCHOLARSHIP | 18,135 | 6,840 | 0 | 10,145 | 0 | 0 | 369,767 | 404,887 |
| SALARIED/HOURLY STAFF | 253,591 | 636 | 0 | 53,120 | 0 | 0 | 0 | 307,347 |
| FRINGE BENEFITS | 10,617 | 3,369 | 0 | 70,840 | 0 | 0 | 0 | 84,826 |
| SUBTOTAL | 1,811,249 | 61,923 | 0 | 1,085,343 | 0 | 0 | 446,109 | 3,404,624 |
| SUPPORT | | | | | | | | |
| MISCELLANEOUS WAGES | 21,009 | 5,288 | 0 | 31,325 | 0 | 0 | 0 | 57,622 |
| TRAVEL | 32,037 | 30,302 | 0 | 84,996 | 0 | 0 | 0 | 147,335 |
| SUPPLIES & EXPENSES | 237,779 | 54,093 | 0 | 240,117 | 0 | 0 | 1,600 | 533,589 |
| OCCUPANCY & MAINTENANCE | 45,927 | 8,410 | 0 | 75,310 | 0 | 0 | 0 | 129,647 |
| EQUIPMENT | 135,427 | 13,872 | 0 | 426,399 | 0 | 0 | 0 | 575,698 |
| OTHER EXPENSES | 90,076 | 8,983 | 0 | 152,172 | 0 | 0 | 0 | 251,231 |
| CREDITS & TRANSFERS | 137,841- | 15,180- | 0 | 65- | 0 | 0 | 18,627- | 171,713- |
| SUBTOTAL | 424,414 | 105,768 | 0 | 1,010,254 | 0 | 0 | 17,027- | 1,523,409 |
| INDIRECT COSTS | 0 | 0 | 0 | 403,351 | 0 | 0 | 0 | 403,351 |
| TOTAL EXPENDITURES | 2,235,663 | 167,691 | 0 | 2,498,948 | 0 | 0 | 429,082 | 5,331,384 |
| INFORMATION PROCESSING | 165,666 | 0 | 0 | 759 | 0 | 0 | 0 | 166,425 |

DEPARTMENT:
FISCAL YEAR: 1988-89

| | BASIC (01-1,01-3) | SELF-SUPPORTING (02-1) | ALLOCATED (01-5,01-6,01-7, 02-6,02-7) | RESTRICTED (03-X,04-X) | GRAND TOTAL |
|---|---|---|---|---|---|
| EXPENDITURES | | | | | |
| SALARIES | | | | | |
| PROFESSIONALS | 133,645 | 0 | 0 | 46,420 | 180,065 |
| FACULTY | | | | | |
| FULL-TIME (INCLUDING DEPARTMENT CHAIR) | 1,173,415 | 0 | 7,477 | 27,122 | 1,208,014 |
| PART-TIME/OTHER (INCLUDING OVERLOAD) | 8,059 | 0 | 4,778 | 174,400 | 187,237 |
| GRADUATE STUDENTS | 125,396 | 16 | 49,500 | 683,565 | 858,477 |
| POST DOCTORAL FELLOWS | 19,250 | 0 | 0 | 154,521 | 173,771 |
| TUITION/SCHOLARSHIP | 76,850 | 0 | 283,882 | 44,155 | 404,887 |
| SALARIED/HOURLY STAFF | 235,122 | 18,469 | 636 | 53,120 | 307,347 |
| FRINGE BENEFITS | 0 | 6,369 | 3,373 | 75,084 | 84,826 |
| SUBTOTAL | 1,771,737 | 24,854 | 349,646 | 1,258,387 | 3,404,624 |
| SUPPORT | | | | | |
| MISCELLANEOUS WAGES | 16,652 | 3,009 | 5,926 | 32,035 | 57,622 |
| TRAVEL | 22,912 | 885 | 33,062 | 90,476 | 147,335 |
| SUPPLIES AND EXPENSES | 85,208 | 124,909 | 68,656 | 254,816 | 533,589 |
| OCCUPANCY AND MAINTENANCE | 40,921 | 13,835 | 960 | 73,931 | 129,647 |
| EQUIPMENT | 81,962 | 3,292 | 61,248 | 429,196 | 575,698 |
| OTHER EXPENSES | 72,523 | 3,100 | 19,198 | 156,410 | 251,231 |
| CREDITS AND TRANSFERS | 2,989- | 168,659- | 0 | 65- | 171,713- |
| SUBTOTAL | 317,189 | 19,629- | 189,050 | 1,036,799 | 1,523,409 |
| INDIRECT COSTS | 0 | 0 | 0 | 403,351 | 403,351 |
| TOTAL EXPENDITURES | 2,088,926 | 5,225 | 538,696 | 2,698,537 | 5,331,384 |
| INFORMATION PROCESSING | 165,666 | 0 | 0 | 759 | 166,425 |

# The Role Of Institutional Research In Developing A Campus Affirmative Action Plan

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Many colleges and universities across the country are stressing diversity in their employee work forces. Indeed, the Federal Government, through the Office of Civil Rights, requires that any institution receiving more than $50,000 in Federal funding and employing more than 50 people maintain on file a current Affirmative Action Plan to ensure equity of opportunity in hiring practices. This includes virtually all colleges and universities receiving substantial Federal financial aid for students as well as those with government contracts and grants. The enforcement arm of the Federal Government, the Office of Federal Contract Compliance Programs, has put teeth into this mandate through regular review of the Affirmative Action Plan, with a particular eye toward data integrity and analysis. As a premium on data integrity is imposed, many institutions are looking to their institutional research offices for assistance.

Such was the case at the University of Delaware, After an OFCCP review suggested the need for improved data analysis in support of the Affirmative Action Plan, the Office of Institutional Research and Planning was called upon to assist in the structuring of an appropriate framework for analysis, to coordinate data collection, and to produce an analysis consistent with OFCCP guidelines.

The logical starting place for an office of institutional research seeking to assist in the analysis of affirmative action data is the Federal regulations. The central regulation defining the format and content of a college or university's Affirmative Action Plan was promulgated in 1971 as 41 CFR 60-2, known as Revised Order #2. The regulations are generally on file in the Affirmative Action Office at most institutions and if they cannot be found there, they can be obtained from the Department of Health, Education, and Welfare in Washington, D.C. The regulations require, and define formats for developing the following central components of an affirmative action data analysis:

1. A workforce analysis
2. A personnel utilization analysis
3. An eight factor analysis of personnel availability
4. Establishment of hiring goals
5. Identification of problem areas

Institutional research can play a central and crucial role in each of these areas. A workforce analysis is precisely what the name implies: an analysis of the institutional workforce

along selected variables. In order to begin the analysis, job titles must first be grouped within categories that reflect similar job content, supervisory responsibilities, job qualifications, and compensation levels. Each institution should examine the Federal regulations to determine the precise applications of job grouping guidelines to their specific circumstances, but the general qualities described above fairly capture the spirit of those regulations.

At the University of Delaware, EEO-6 job categories (i.e., Executive/Administrative/Managerial, Faculty, Professional, Secretarial/Clerical, Technical/Paraprofessional, Skilled Craft, and Service Maintenance) were used as the starting point. The University has a position classification ladder for professionals and salaried staff which groups job titles into ladder steps based upon job content, employee qualifications, etc.; these position classifications were used to group job titles into entry level, junior-level, mid-level, and senior level job groupings for all EEO-6 categories save faculty. Vice-Presidents and the President were designated as a "Cabinet-Level" grouping within the Executive/Administrative/Managerial job grouping. Faculty naturally group by academic rank. An elaboration of this job grouping strategy is found in Appendix A.

Once job grouping are established, a personnel utilization analysis looks at the composition of the institutional workforce within those job groupings. Employees within the job groupings are analyzed by ethnicity and gender. A sample personnel utilization analysis is included in Appendix B.

Perhaps the most difficult analytical component of the Affirmative Action Plan is the eight factor analysis of personnel availability. This analysis requires the collection of employee availability data from a variety of disparate sources, and the weighting of those availability data within the context of eight specific factors. Those factors include the following:

1. The minority and female population of the labor area surrounding the institution.

1a. The availability of women seeking employment in the labor area surrounding the institution.

2. The size of the minority and female unemployment rates in the labor area surrounding the University.

3. The percentage of the minority and female workforces as compared with the total workforce in the labor area surrounding the institution

4. The general availability of minorities and females having requisite skills in the immediate area.

5. The availability of minorities and females having requisite skills in an area from which the institution can reasonably recruit.

6. The availability of promotable or transferable minorities and women within the institution.

7. The existence of training institutions capable of training minorities and/or females in the requisite skills.

8. The degree of training which the institution is reasonably able to undertake as a means of making all job groupings available to minorities and females.

It is incumbent upon the institution to examine each of these eight factors as they apply to a given job grouping, and to attach appropriate weights to each factor in calculating availability of minority and female personnel for a given position. It is worthwhile to walk through each of the eight factors as they apply to the University of Delaware to illustrate how the eight factor analysis works. Consider factor 1, the minority and female population surrounding the University. The labor area surrounding the University, for purposes of this analysis, is defined as the State of Delaware. While we know that the State's population is 19% minority and 52% female, these data do not address the requisite skills needed for employment within the various job groupings at the University. Consequently, little weight is normally assigned to this factor by institutions of higher education. Similarly, factors 1a, 2, and 3, as listed above, all lack precision with respect to requisite skills for employment and are assigned little weight.

On the other hand, factor 4, the general availability of minorities and females having requisite skills in the immediate area is obviously an important factor. In determining the availability of such employees, data are available from the U.S. census and may be provided by the Federal government or may be obtained for specific job groupings from private consulting firms who massage the census data precisely for affirmative action purposes. The University of Delaware has used both private consultants and public data sources, and finds its own College of Urban Affairs, which is also the State repository for census data, to be the most reliable source of information.

The weight assigned to this factor will vary across job groupings and across EEO categories. For example, when hiring an assistant professor, some weight will be assigned to local availability of talent, although more weight will likely be assigned to the national availability pool. Greater weight will be assigned to the local pool when hiring a junior computer programmer than when hiring a Director of Computing, where the national pool would again carry greater weight. When hiring a secretary or facilities worker, the local pool would likely carry virtually all of the weight as institutions generally do not

recruit broadly for these positions.

The scope of the recruiting pool is at the core of factor 5, the availability of minorities and women having requisite skills in an area in which the University can reasonably recruit. Among Executive/Administrative/Managerial and senior level professional employees, as well as most junior and senior faculty positions, the University seeks the broadest pool of candidates. Consequently, national availability data are used. The U.S. Census is again an excellent source of data, and is well supplemented by data on degrees granted within specific academic disciplines, as compiled in two additional sources. Availability Data, published by the Affirmative Action Office at the University of Colorado at Boulder, is the benchmark source of faculty availability information, while the National Center for Educational Statistics (NCES) publishes annual reports of degrees granted in academic disciplines. Professional accrediting agencies and professional associations are also good sources of national availability data. As noted, the scope and range of the recruiting pool, and the weight assigned to it, is generally dictated by the job title and the nature of the duties and responsibilities inherent therein.

The University of Delaware, as do most schools, places importance on internal promotability for its employees. This issue is directly addressed in factor 6. Higher education is something of an anomaly in the Executive/Administrative/Managerial and senior professional areas in that to move up, one must generally move to another institution. Faculty and salaried staff are quite another story. Full professors largely come from the ranks of associate professors, and an assistant professor must achieve associate professor status to achieve tenure and remain at the University beyond seven years. Salaried staff generally move up the classification hierarchy via internal transfer and promotion. Thus, factor 6 is weighted in accordance with the job grouping within each of the EEO-6 categories.

Factor 7, the existence of training institutions capable of training minorities and females in the requisite skills does not carry the weight that one might assume on first glance. Most universities and colleges recruit employees with prior experience as opposed to hiring individuals directly out of school. The exception to this rule are assistant professors within the faculty who may well be hired directly from a doctorate-granting institution, However, this is accounted for in factor 5, where Colorado's Availability Data and NCES Degrees Granted data are used in defining national availability pools. Consequently this factor is given little weight.

Finally, factor 8, the degree of training which the University is reasonably able to undertake as a means of making all job classes available to women and minorities, is important. The University's tuition waiver policy, its extensive program of in-house/in-service training programs, and its financial support

of professional development activity all contribute to the opportunity for any given employee to acquire skills that will ultimately render him/her promotable. Thus, this factor is accorded some weight across all job groupings.

Having assigned weighting to each of the eight factors, those weights are then multiplied by actual employee availability data extracted from appropriate sources to arrive at a composite availability percentage reflective of those assigned weights. This composite availability percentage is then compared against the actual percentage of employees in the workforce as defined in the personnel utilization analysis. The University of Delaware has adopted the position that its hiring goal is to have a workforce reflective of the availability pool. THus, where the utilization percentage exceeds the availability percentage, underutilization is not a problem and no hiring goal is established. On the other hand, where the utilization percentage is greater than one percentage point below the availability percentage, the University views this as underutilization and establishes a hiring goal that will recruit and employ the appropriate number of individuals within an underutilization category to bring the University to the point where it equals or exceeds the availability pool. The full concept of availability analysis and establishment of hiring goals is illustrated in Appendix C.

Because hiring goals may be the subject of some debate on campus, it is important to involve the broadest possible constituency in their development. The identification of appropriate sources of availability data and the assignment of appropriate weights thereto in the eight factor availability analysis is not solely the function of the Affirmative Action Office and/or Institutional Research and Planning. While these two offices are the chief facilitators in the analytical process, verification of personnel utilization data, consultation on availability data sources and weighting are all done at the college and administrative unit level, with full participation of Deans and Vice Presidents. Indeed, these individuals are strongly encouraged to push the process down to the department chair/unit director level. To the extent that preliminary consensus can be achieved on the structure of the utilization and availability analyses, enthusiastic endorsement of hiring goals becomes more operational.

Having completed the availability/goal setting analysis, the final task for institutional research is analysis in support of identification of problem areas. This entails examination of instances of underutilization in job groupings within employee classes across all units of the institution to determine where patterns begin to appear. For example, it is not uncommon to find patterns of underutilization of women in senior management ranks at an institution, or to find underutilization of minorities in senior faculty ranks. Having identified problem areas, the data are transferred to the Affirmative Action Office

where, in concert with units displaying the underutilization problems, specific remedial strategies are developed in a fashion wherein progress is quantifiable and may be monitored throughout the year.

The role of institutional research in the affirmative action process is a crucial one. Institutional research offices are generally viewed as objective, non-politicized units within colleges and universities. Consequently, data related to affirmative action planning and strategy emanating from institutional research offices are generally viewed as free of hidden agendas. This concept of data integrity is essential to broad implementation and acceptance of hiring goals across the campus. As institutions increase their emphasis on diversity in the workforce, it is not unreasonable to conjecture that the role of institutional research in the affirmative action process will continue to grow.

APPENDIX A

EXECUTIVE/ADMINISTRATIVE/MANAGERIAL

Cabinet Level - Non classified (Minimum - $60,000 per year)

Incumbents at this level are the primary administrators of the institution and are responsible for the global policies and the direction of the institution. The positions included at this level are the president, the provost, and the vice presidents.

Senior Level - Positions classified at level 17, 18 and 19 in the system and some non-classified academic positions (Minimum - $40,107 per year)

These positions are the senior directors and deans of the various colleges and units. Incumbents in these positions are responsible for the direction and management of large and often multi-functional organizational areas.

Mid-level - Positions classified at level 16 in the system and some non-classified academic positions (Minimum - $34,192 per year)

Positions classified at this level are responsible for the administration of programs with University-wide impact. These directors and department chairpersons normally report to senior level administrators or cabinet level positions.

Junior Level - Positions classified at level 15 in the system (Minimum - $29,866 per year)

Director positions at this level are responsible for medium-sized units. These positions are often highly visible in state-wide programs that impact the academic units of the institution.

FACULTY

Professor - (Minimum - $37,868 per year)

This faculty rank is reserved for individuals who have established reputations in their disciplines and whose contributions to the University's mission is unquestioned. This is the highest level of faculty rank and tenure is automatic.

Faculty, Continued

Associate Professor - (Minimum - $30,800 per year)

This is the lowest level of faculty rank that carries with it tenure. The qualifications are especially rigorous; the individual must show excellent achievement in scholarship and teaching and there must be unmistakable evidence that the individual has progressed and will continue to progress in the faculty system.

Assistant Professor - (Minimum - $24,200 per year)

This is a non-tenured level position at the University. The faculty member, in almost all cases, must possess an earned doctorate and a demonstrated ability and desire to achieve excellence in scholarship and teaching.

Other - (Minimum - $17,655 per year)

These positions are non-tenured and considered temporary. Incumbents are normally hired on a yearly contract. This rank is not used for permanent faculty and these positions are not expected to progress through the other ranks.

PROFESSIONAL

Senior Level - Positions classified at levels 17, 18 and 19 in the system(Minimum of $40,770 per year)

These positions are at the highest level in the professional classification system and are often second in command of large or multi-functional organizations. Individual contributors at this level normally have a Ph.D. and are considered leaders in their fields and/or provide innovative or theoretical research applications.

Mid-level - Positions at level 16 in the system (Minimum of $34,192 per year)

Positions at this level are often second in command of medium-sized units or address issues that extend beyond the University. Researchers and technical professionals normally require a Ph.D. and eight to ten years experience.

Professional, Continued

Junior Level - Positions at levels 14 and 15 in the system (Minimum of $26,488 per year)

Incumbents in these positions normally manage other professionals engaged in specialized duties. The ability to interpret policy in unique circumstances is essential at this level. Research positions normally require a Ph.D.

Entry Level - Positions at levels 11, 12 and 13 in the system (Minimum of $17,995 per year)

Positions grouped at this level require independent judgement and discretion as a integral part of their everyday activities. These positions may supervise other entry-level professionals and/or staff. Career ladders for research support and professional librarians start at this level.

SECRETARIAL/CLERICAL

Senior Level - Positions classified at levels 6, 7 and 8 in the system (Minimum - $15,374 per year)

These positions are at the highest level in the secretarial/clerical families at the University. The incumbents normally manage an office and supervise other secretarial/clerical employees. Positions at this level frequently require an associates degree and/or eight to ten years experience.

Mid-level - Positions classified at levels 4 and 5 in the system (Minimum - $13,268 per year)

Incumbents in these positions are seasoned clerical employees that normally have over 5 years experience. These positions may keep complicated budget/account records and/or support the work of a large office. Some supervision of entry level secretarial/clerical employees may be found at this level.

Junior Level - Positions classified at levels 1, 2 and 3 in the system (Minimum - $10,928 per year)

These positions are entry-level clerical jobs and normally require little or no previous experience. Incumbents need close supervision and may do extensive typing or light bookkeeping.

TECHNICAL/PARAPROFESSIONAL

Senior Level - Positions classified at levels 6, 7 and 8 in the system (Minimum - $15,374 per year)

Positions classified at this level are senior laboratory/computer support technicians. Incumbents in these positions are very skilled and are frequently graduates of technical schools. These staff members work under limited supervision and are often supervisors themselves.

Mid-level - Positions classified at levels 4 and 5 in the system (Minimum - $13,268 per year)

There is a wide variety of positions at this level. These technicians are seasoned experts in their field usually with five to seven years experience. Incumbents are considered part of the research/medical team by their professional colleagues.

Junior Level - Positions classified at levels 1, 2 and 3 in the system (Minimum - $10,928 per year)

These are entry level positions where incumbents are expected to follow strict oral and written instructions. Incumbents in these positions normally have little practical experience.

SKILLED CRAFT

Senior Level - Positions classified at levels 6, 7 and 8 in the system (Minimum - $15,374 per year)

Positions at this level are distinguished by their exceptional skill at a given trade. Incumbents in these positions are often considered artisans and are frequently licenced in their respective work. Some employees are foremen or lead workers and supervise others involved in these trades.

Mid-level - Positions classified at levels 4 and 5 in the system (Minimum - $13,268 per year)

These positions are at the journeyman level of their respective trade and the incumbents are highly skilled. Positions at this level normally work independently.

Skilled Craft, Continued

Junior Level - Positions classified at levels 1, 2 and 3 in the system (Minimum - $10,928 per year)

Incumbents in these positions are normally skilled craft helpers and are often working towards completing an apprenticeship. These employees are frequently hired out of high school with little or no experience.

SERVICE/MAINTENANCE

Senior Level - Positions classified at levels 6, 7, and 8 in the system (Minimum - $15,374 per year)

These positions normally supervise large staffs that are doing work in the service/maintenance field. In all but rare instances incumbents are promoted from within their respective area and have eight to ten years experience at the University.

Mid-level - Positions classified at levels 4 and 5 in the system (Minimum - $13,268 per year)

The variety of positions at this level is probably its most distinguishing feature. Employees in these positions are doing mostly manual work requiring limited degrees of acquired skills. Incumbents are frequently promoted into these positions from more junior positions in this family of jobs.

Junior Level - Positions classified at levels 1, 2 and 3 in the system (Minimum - $10,928 per year)

These are entry level positions and incumbents perform duties that are related to the comfort, convenience and hygiene of persons or contribute to the upkeep of the physical property of the University. Persons are normally hired from outside the University and the positions require little or no experience.

PERSONNEL UTILIZATION ANALYSIS

UNIT:

| Job Category | Total Personnel | Total Female | Total Minority | Black | Hispanic | Other Minority | % Female | % Black | % Hispanic | % Other Minority |
|---|---|---|---|---|---|---|---|---|---|---|
| EXECUTIVE/ADMINISTRATIVE/MANAGERIAL | | | | | | | | | | |
| - Cabinet Level | 1 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| - Senior Administrators | 2 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| - Mid-level Administrators | 3 | 3 | 2 | 1 | 1 | 0 | 100.0 | 33.3 | 33.3 | 0.0 |
| - Junior Administrators | 6 | 4 | 1 | 1 | 0 | 0 | 66.7 | 16.7 | 0.0 | 0.0 |
| FACULTY | | | | | | | | | | |
| - Professor | 9 | 2 | 0 | 0 | 0 | 0 | 22.2 | 0.0 | 0.0 | 0.0 |
| - Associate Professor | 12 | 4 | 0 | 0 | 0 | 0 | 33.3 | 0.0 | 0.0 | 0.0 |
| - Assistant Professor | 18 | 13 | 4 | 2 | 1 | 1 | 72.2 | 11.1 | 5.6 | 5.6 |
| - Other | 3 | 2 | 1 | 0 | 0 | 1 | 66.7 | 0.0 | 0.0 | 33.3 |
| PROFESSIONAL | | | | | | | | | | |
| - Senior Professionals | - | - | - | - | - | - | - | - | - | - |
| - Mid-level Professionals | - | - | - | - | - | - | - | - | - | - |
| - Junior Professionals | 6 | 6 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 |
| - Entry Level Professionals | 16 | 13 | 2 | 1 | 1 | 0 | 81.3 | 6.3 | 6.3 | 0.0 |
| SECRETARIAL/CLERICAL | | | | | | | | | | |
| - Senior Level | 7 | 7 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 |
| - Mid-level | 18 | 18 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 |
| - Junior Level | 1 | 1 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 |
| TECHNICAL/PARAPROFESSIONAL | | | | | | | | | | |
| - Senior Level | - | - | - | - | - | - | - | - | - | - |
| - Mid-level | - | - | - | - | - | - | - | - | - | - |
| - Junior Level | - | - | - | - | - | - | - | - | - | - |
| SKILLED CRAFT | | | | | | | | | | |
| - Senior Level | - | - | - | - | - | - | - | - | - | - |
| - Mid-level | - | - | - | - | - | - | - | - | - | - |
| - Junior Level | - | - | - | - | - | - | - | - | - | - |
| SERVICE/MAINTENANCE | | | | | | | | | | |
| - Senior Level | - | - | - | - | - | - | - | - | - | - |
| - Mid-level | - | - | - | - | - | - | - | - | - | - |
| - Junior Level | 5 | 5 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 |

WORKSHEET FOR CALCULATING AVAILABILITY OF WOMEN AND MINORITIES BY JOB GROUP WITHIN EEO-6 CATEGORY, AND FOR DETERMINING INSTANCES OF UNDERUTILIZATION AND ESTABLISHMENT OF HIRING GOALS

PART ONE: WOMEN

UNIT:

| | FACTOR 4 | | FACTOR 5 | | FACTOR 6 | | FACTOR 7 | | FACTOR 8 | | TOTAL | INTERNAL | UNDERUTILI- | | NEW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Availa-bility | Assigned Weight | Availa-bility | Assigned Weight | Availa-bility | Assigned Weight | Availa-bility | Assigned Weight | Availa-bility | Assigned Weight | AVAILA-BILITY | % OF JOB GROUP | ZATION? YES/NO | HIRING GOAL | HIRES NEEDED |
| EXECUTIVE/ADMINISTRATIVE/MANAGERIAL | | | | | | | | | | | | | | | |
| Cabinet Level | 26.8 | 0.05 | 46.7 | 0.85 | 22.2 | 0.05 | 46.7 | 0.00 | 22.2 | 0.05 | 43.3 | 0.0 | YES | 43.3 | 1 |
| Senior Administrators | 26.8 | 0.10 | 46.7 | 0.75 | 22.2 | 0.10 | 46.7 | 0.00 | 22.2 | 0.05 | 41.0 | 0.0 | YES | 41.0 | 1 |
| Mid-level Administrators | 26.8 | 0.30 | 54.4 | 0.55 | 55.7 | 0.10 | 54.4 | 0.00 | 55.7 | 0.05 | 46.3 | 100.0 | NO | | |
| Junior-level Administrators | 26.8 | 0.30 | 54.4 | 0.55 | 55.7 | 0.10 | 54.4 | 0.00 | 55.7 | 0.05 | 46.3 | 66.7 | NO | | |
| FACULTY | | | | | | | | | | | | | | | |
| Professor | 39.3 | 0.05 | 46.7 | 0.15 | 33.3 | 0.80 | 46.7 | 0.00 | 33.3 | 0.00 | 35.6 | 22.2 | YES | 35.6 | 2 |
| Associate Professor | 39.3 | 0.05 | 54.4 | 0.25 | 72.2 | 0.70 | 54.4 | 0.00 | 72.2 | 0.00 | 66.1 | 33.3 | YES | 66.1 | 5 |
| Assistant Professor | 39.3 | 0.00 | 54.4 | 1.00 | 0.0 | 0.00 | 54.4 | 0.00 | 0.0 | 0.00 | 54.4 | 72.2 | NO | | |
| Other | 39.3 | 0.60 | 36.6 | 0.40 | 0.0 | 0.00 | 36.6 | 0.00 | 0.0 | 0.00 | 38.2 | 66.7 | NO | | |
| PROFESSIONAL | | | | | | | | | | | | | | | |
| Junior Professionals | 50.1 | 0.50 | 47.2 | 0.05 | 55.7 | 0.40 | 49.6 | 0.00 | 55.7 | 0.05 | 52.5 | 100.0 | NO | | |
| Entry Level Professionals | 50.1 | 0.90 | 47.2 | 0.00 | 55.7 | 0.05 | 49.6 | 0.00 | 55.7 | 0.05 | 50.7 | 81.3 | NO | | |
| SECRETARIAL/CLERICAL | | | | | | | | | | | | | | | |
| Senior Level | 76.0 | 0.10 | 75.0 | 0.00 | 97.1 | 0.85 | 50.8 | 0.00 | 97.1 | 0.05 | 95.0 | 100.0 | NO | | |
| Mid-level | 76.0 | 0.40 | 75.0 | 0.00 | 79.1 | 0.55 | 50.8 | 0.00 | 79.1 | 0.05 | 77.9 | 100.0 | NO | | |
| Junior Level | 76.0 | 0.90 | 75.0 | 0.00 | 79.1 | 0.05 | 50.8 | 0.00 | 79.1 | 0.05 | 76.3 | 100.0 | NO | | |
| SERVICE/MAINTENANCE | | | | | | | | | | | | | | | |
| Junior Level | 38.4 | 0.95 | 35.6 | 0.00 | 64.2 | 0.05 | 50.8 | 0.00 | 64.2 | 0.00 | 39.7 | 100.0 | NO | | |

NOTE: Within faculty ranks, full and associate professors are tenured; assistant professors and other faculty titles (e.g. instructors and and lecturers) are non-tenured.

# The Nature and Scope of Institutional Research: The Changing Face of the IR Profession

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This paper is written as a personal reflection on a dozen years in the institutional research profession, particularly with respect to how the profession has changed, and where it is likely headed. The reflection is an outgrowth of watching institutional research offices across the nation react (or in all too many cases, fail to react) to external environmental pressures. Leading among these pressures are shrinking enrollments and constricting institutional budgets, although I would argue that there are other more subtle, but equally powerful pressures that create a context for viewing the utility of an institutional research office. A significant number of institutional research offices have been eliminated in recent years. Others have experienced major staff reductions. If institutional research is a viable function that is essential to the lifeblood of a vibrant institution, why are some colleges and universities walking away from it or diluting it by dispersing IR functions across other offices on campus? The answer may lie in the extent to which institutional research at a given school actually does contribute to the vibrancy of that school.

In writing A Handbook for Newcomers to Institutional Research (1990), I wanted to provide the new institutional research practitioner with a context for thinking about the IR process, and for establishing a program of research. As I developed this context, however, I found myself re-evaluating my own assumptions about what institutional research is, and how the process can best respond to the constantly changing needs of a postsecondary institution.

It seems to me that the essence of institutional research is embedded in its ability to respond to three basic questions central to the continued survival of any organization:

1. **Where is the organization at this moment?** Specifically, what is the fit between a college or university's institutional mission and the programs and services which it currently has in place? What is the institution's position within the educational marketplace? Who are the competition and what are they doing?

2. **Where is the organization going?** What do indicators tell us about potential changes in the environment in which the organization functions? What changes should be considered with respect to programs and services currently offered that are: a) consistent with the institutional mission, and b) reflective of changing environmental conditions?

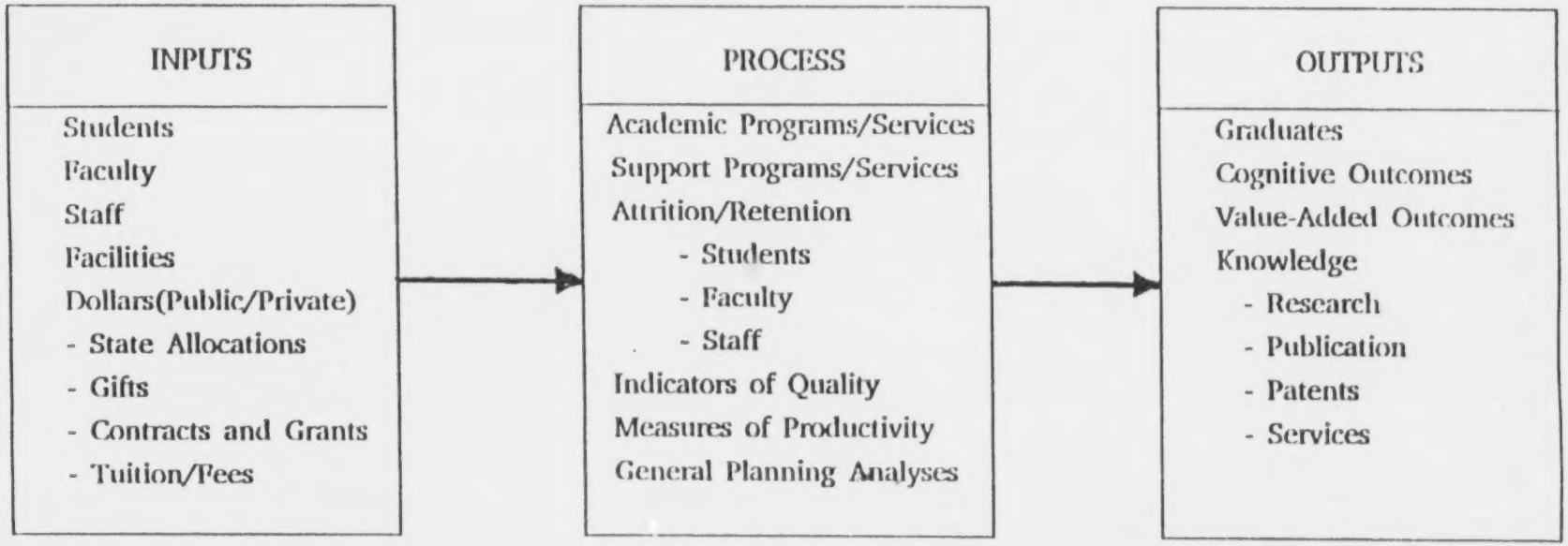
3. **How can the organization best arrive at its desired end?** What are the alternative courses of action available to the institution in pursuing its objectives? What are the costs associated with implementation of the various alternatives? Can the institution afford to act? Can the institution afford not to act?

The viability and relevance of institutional research is determined by its ability to respond to these questions. I recall coming to the University of Delaware in 1985 and inheriting an institutional research enterprise which was a magnificent exercise in counting. Credit hours, students, faculty, buildings, books --- you name it, they counted it. If you wanted to know the number of students of Norwegian extraction, with blond hair, blue eyes, nearsightedness, and names ending in "-sen", they could tell you. If you wanted to know who the University's primary admissions competitors were, and the variables upon which they consistently topped the University in recruiting first-time freshmen, or if you wanted to know the cost of educating a student at the University, and the extent to which this cost was subsidized through State appropriations --- well, there must be some office on campus that could give you that information. Superb counters that they were, institutional research goes well beyond mere description. In my judgement there would be no Office of Institutional Research and Planning at the University of Delaware had that pattern of "research" been allowed to continue. Like all colleges and universities in the late 1980's, Delaware was experiencing significant pressures on the type of educational product it delivered, on the process through which it was delivered, and on the resources needed to drive the entire enterprise. To assist the University in analyzing all of the above, a systematic approach to institutional analysis was essential.

My own training in the natural sciences, coupled with work done with Richard H. Hall during my doctoral days at the State University of New York at Albany predisposed me to look at institutions from an "open systems" perspective. Howard Aldrich (1976) and Richard Hall (1987) have been major forces in shaping my view of organizations as comprised of three central components: inputs, process, and outputs. In order to function and remain viable, the organization must continuously secure new inputs, and process them to generate a high quality product. Implicit in this cycle of events is an on-going series of transactions with an environment external to the organization, an environment which must ultimately supply the raw materials (inputs) and which serves as the ultimate arbiter as to whether the organizational product has sufficient "quality" to merit continued consumption.

Some of my colleagues have challenged this paradigm as to closely related to an industrial model to bear relevance to higher education. I think not. Look at Figure 1 and consider the inputs into the higher education enterprise. We require

FIGURE 1
CONCEPTUAL FRAMEWORK FOR ANALYSIS OF UNIVERSITY FUNCTIONS




EXTERNAL ENVIRONMENT

- Fiscal/Economic considerations
- Marketplace Considerations
- Governmental/Regulatory Considerations
- Other Considerations

students, faculty, and staff. We need buildings in which to teach and conduct other aspects of educational business. We need money to pay salaries, to buy books and equipment, and to fund other business-related activities. Institutional research describes these inputs in a way that answers such fundamental questions as: Who or what are they? How many are there? What do they look like? The same questions may be applied to outputs of the educational enterprise, i.e., graduates, knowledge as measured by research, publications, patents, public service, etc.

The challenge to institutional research is the analysis and description of the "process" of higher education. How is knowledge transmitted? How do we know if we're doing a good job? How do we know if we're doing it efficiently and effectively? How do we measure the environmental transactions that can profoundly affect the efficiency and effectiveness of the educational enterprise? I argue that coming to terms with these challenges to institutional research is having the effect of dramatically altering the nature and scope of the work associated with the profession I entered back in 1978.

Simple description of inputs no longer suffices as the sum total of institutional research in that area. Market analysis in support of admissions activity is absolutely essential in identifying where student inputs are and how they are likely to behave in selecting a college or university. Precise definition of institutional position within the marketplace, vis-a-vis specific competitors when measured along specific variables, is crucial to effectively competing for a shrinking pool of college-bound high school seniors. Similar assessments are necessary with respect to recruiting the best and brightest among faculty and staff. What is the institution's posture with respect to competitive compensation? Are appropriate pools of available personnel readily identifiable in support of institutional movement to a more diverse workforce? Are institutional revenue streams in healthy condition? Is the institution more or less tuition dependent than the pool of peer institutions to which it aspires. What is the long term prognosis for revenue streams? Will the institution be able to afford the full range of its planning initiatives? These issues go considerably beyond the demographic descriptions of inputs that characterized institutional research when I entered the profession a dozen years ago.

Description of process is no less challenging. I can remember when grade distribution analyses, degrees granted summaries, credit hour production reports, etc. were adequate descriptors of "process". The very daring might even throw in student/faculty ratios and a variant on a staffing model to suggest optimal ways of operating the educational enterprise. The last dozen years has witnessed the introduction of three somewhat foreign and powerfully fearsome words into discussions concerning higher education --- COST, PRODUCTIVITY, and QUALITY. Who else but institutional research is in a position to address

these issues?

Perhaps the single greatest shift in my own institutional research program over the years has been movement into the area of budget planning and cost analysis. Accounting and budgeting could contentedly be left to the gurus in the business office in times when fiscal resources were plentiful. We now operate in an environment where resources are lean and senior managers are looking for objective measures of productivity and efficiency. What does it really cost to generate a student credit hour of instruction in English or History? What is the outside tolerable income to expense margin in resource intensive curricula that will permit continued subsidy by enrollment intensive programs? What are the implications to other cost centers when salary equity issues are addressed? What are the quantifiable economic benefits of having a majority non-resident student body at an institution that is at least partially supported by state tax dollars? What is the relative fiscal health of the institution as measured by the manner in which it manages the full spectrum of its fiscal affairs, and how does this health report compare with comparable institutions? These are issues I'd never have imagined I'd address when I entered institutional research. The fact that this year's NEAIR Conference Program contains a workshop entitled "Principles of Financial Management and Analysis for Institutional Researchers", and another entitled "Institutional Planning - Principles and Applications", speaks eloquently to the central role that institutional research can and must play in decision support and policy analysis on campus.

How good are we at delivering a quality education? Indeed, what do we mean by "quality"? Legislatures, consumer groups, and other advocacy groups are demanding accountability in higher education, and from those demands, the current assessment movement has grown. I am genuinely concerned that institutional researchers are being swept up in the push for assessment without having been a major player in defining which "outcomes" merit study, and the measures to be used in assessing those outcomes. Do we have a high quality faculty and staff supporting the educational process? How do we know? Are we using unbiased admissions criteria to ensure that we are selecting students who have a reasonable chance of graduating? How can we tell is the college or university experience has substantially changed the intellectual, attitudinal, and behavioral characteristics of students. Has institutional research, as a profession, thought these issues through and established legitimate strategies for addressing them that will lend themselves to interinstitutional comparison?

As noted at the outset of this paper, the pressures on institutions of higher education at present are intense. The nature of those pressures is different from any experienced in recent memory in that they call for real institutional introspection with respect to what colleges and universities are

doing, how well they are doing it, and what should be done differently. Institutional research can and should play a central supportive role in this introspection. Those offices that meet the challenge will lead their institutions into the twenty-first century. Those that continue with "business as usual" will, fear, find themselves out of business by the year 2000.

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# CULTIVATING THE LOYALTY OF YOUNG ALUMNI TO THEIR ALMA MATER: THE SUCCESS OF THE CORNELL TRADITION PROGRAM

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## INTRODUCTION

Ezra Cornell founded his university with a commitment to provide students with opportunities for work as well as for study. The Cornell Tradition Fellowship Program, which is alumni-supported, is a contemporary expression of the founder's vision. The program awards six hundred fellowships each year to undergraduate students who have demonstrated significant work experience, community service, and scholarly achievement. An award of up to $2500 a year will reduce by that amount the indebtedness a student may incur in obtaining the Cornell degree. In addition to awarding fellowships, the Cornell Tradition Program aims to enhance students' experiences during their undergraduate years and also to cultivate alumni who have strong commitments to the prosperity of Cornell University. The Tradition alumni are expected to provide the subsequent generations with job opportunities and financial support, and be actively involved in various volunteer activities.

The Cornell Tradition Program began its full operation in 1983, launched by pledges of over $7 million from an anonymous group of Cornell University alumni and friends. It has just completed its seventh year in operation. This seems an appropriate point at which to determine the program's success in meeting its objectives. In the first part of this article, the innovative character of the Cornell Tradition Program will be described in terms of its origin, objectives, and operation. In the second part, results from survey research concerning the Cornell Tradition Program will be presented so as to establish the extent to which the program has achieved its objectives.

## OBJECTIVES OF THE CORNELL TRADITION PROGRAM

In 1982, the need for the Cornell Tradition Program became apparent.

This need resulted in large part from events of the previous decade, during which time the costs of education had escalated and the available scholarship funds for students had not maintained a similar pace. As a result, the financial burden on students and their parents for college education increased considerably. This burden on students was manifested in an increase in the individual student self-help amount (which includes loans, work, and summer savings) required by the university and in an increase in students' college loan indebtedness upon graduation.

As a result of the increasing burden on students for their education costs, one of the main purposes of the Cornell Tradition Program became to provide qualified students with substantial fellowships so as to reduce the amount these students would have to pay in loans. It is important to clarify that the Tradition fellowships have not been used as a method of meeting educational costs that cannot be met by other means such as loans. Rather, they have been used as a method of reducing loan amounts of students whose financial needs are already met by various types of financial aid. At present, the loan burden on students is projected to continually increase (Henderson, 1987). Thus, the Cornell Tradition Fellowship Program fulfills a very essential purpose through its innovative means of reducing educational costs and loan indebtedness.

Four areas of objectives for the Cornell Tradition Program were set forth in the original Cornell Tradition statement of purpose of October, 1982. These four areas of objectives involve more than providing scholarships to a select number of qualified students in order to reduce their overall loan amounts. The goals have been designed to address and influence several key aspects of students' lives during both their undergraduate years and after graduation. The goals of the Cornell Tradition Program are to help Cornell University:

1) remain competitive in recruiting the most promising students by offering fellowships and career-related summer employment opportunities (admissions/recruitment goal);

2) make career-related job opportunities available during undergraduate years, so that students may meet educational costs through participation in work (employment opportunity goal);

3) reduce indebtedness of students to make it easier for them to pursue graduate study or service-related careers (indebtedness goal); and

4) instill in Tradition Fellows the moral obligation to perpetuate the Cornell Tradition through future service and financial assistance (gift giving goal).

Included in the objectives is the expectation that graduates of the Cornell Tradition Program will ultimately come full circle from being recipients of the program to being contributors of the program upon graduation, assisting in the maintenance of the program by volunteering their time and monetary gifts.

## OPERATION OF THE CORNELL TRADITION PROGRAM

The Cornell Tradition Program allocates two types of awards: fellowship awards and book awards. The selection procedure for the fellowship awards requires that applicants be full-time continuing undergraduates who qualify for needs-based aid. Fellowship awards have typically involved up to $2500 per student per academic year. Book awards, which have typically been $250, are granted to students who are not eligible for financial aid, but meet the other Tradition selection requirements.

The specific fellowship opportunities are the Freshman Fellowships for freshmen, Transfer Fellowships for transfer students, Academic Year Fellowships for upperclassmen, and Summer Fellowships for the Cornell Tradition fellows who could not meet summer saving expectations for legitimate reasons. Fellowships and book awards are awarded competitively, based on the requirements of a minimum of 250 hours of work experience (200 hours of work for freshmen), a minimum of 75 hours volunteer and/or extra-curricular experience, and a minimum grade point average of 2.3.

The work requirements for eligibility in the Cornell Tradition Program are intended to fulfill the Tradition Program goal for employment opportunities to encourage students to assume greater responsibility in meeting educational costs through participation in work. Furthermore, the need-based requirement for eligibility in the Tradition fellowship programs aims to help Cornell remain competitive for the most desirable and promising students by providing an incentive to qualified needs-based students to apply and remain at Cornell.

In addition to the fellowships and book awards, an opportunity for students to find career-related summer jobs exists with the program called the Summer Job Network. The Summer Job Network originally operated under the Cornell Tradition Program, and is consistent with the founding goals of the Cornell Tradition Program, but is now considered a separate program. The Summer Job Network (SJN) aims at fulfilling the program goals for providing students with career-related employment. The SJN Program specifically aims to bolster the recruitment efforts for undergraduate students by offering the opportunity for career-related summer employment to continuing students <u>regardless of need</u>. In addition, the SJN Program aims to improve the employability of Cornell graduates by making career-related opportunities available to them during their undergraduate programs. The SJN Program is open to all students who are enrolled in a degree program at Cornell with a minimum 2.0 GPA and are able to work at least 35 hours per week for eight weeks during the summer.

## THE CORNELL TRADITION RESEARCH: OBJECTIVES AND DESIGN

The research for the Cornell Tradition Program attempts to examine the question "how well is the Cornell Tradition Program fulfilling its specific objectives?" A six page-long questionnaire was created to measure response difference between the Cornell Tradition alumni and the alumni who did not participate in the program. The questions were asked in the following five

areas: level of indebtedness from undergraduate education; graduate school status; employment status; attitudes toward alumni functions; participatory experience in alumni activities and level of gift giving.

The major focus of this paper is to determine whether the Cornell Tradition Fellowship Program has successfully cultivated alumni who contribute to Cornell University in terms of monetary gifts. To evaluate the success of the program, however, requires more than a simple comparison of the level of monetary contribution between the CT alumni and non-CT alumni. The existing literature has indicated that alumni gift-giving behavior is a function of the two principal factors of motivation to give and financial capability to give (Volkwein, 1989; Connolly, 1986; Paton, 1986). Financial capability, which can be measured by alumni's salary or indebtedness level, is a primary condition for alumni gift-giving behavior. Alumni must be also motivated to utilize their financial capability to give monetary gifts to their Alma Mater.

To measure the success of the Cornell Tradition program, therefore, we must test whether the Cornell Tradition alumni have made significantly higher monetary contributions than the non-Tradition alumni, while the effects of motivation and financial capability factors are taken into consideration.

## MEASUREMENTS AND DATA SOURCE

The questionnaire was mailed to 166 Cornell Tradition alumni who graduated during the 1987 academic year. The 166 non-Cornell Tradition alumni (control group) were selected based on a stratified random sampling procedure, so that the control group would possess the same attributes as the Tradition group in terms of ethnicity, financial aid status, gender, and college. The survey was conducted in March, 1988. The final response rate was 66.9% for the Tradition group and 61.1% for the Control group. The present study utilizes the following questionnaire responses for the analysis.

(1) **Program status** - 1 is coded for the Cornell Tradition alumni and 0 for the non-Cornell Tradition alumni

(2) **Self-reported indebtedness level (in dollar) from undergraduate education**

(3) **Employment status** - 1 is coded for those employed and 0 for those not employed.

(4) **Graduate/Professional school status** - 1 is coded for those studying at graduate/professional schools and 0 for those not studying.

(5) **Self-reported salary level in dollars**

(6) **Motives for gift-giving** - The respondents indicated 1 (strongly agree), 2 (agree), 3 (disagree), or 4 (strongly disagree) with the statement that "More alumni ought to invest money and energy in Cornell

University programs to help future undergraduates get a start with their careers." 5 (No Opinion) was treated as a missing value.

In addition to these six questionnaire responses,

(7) the respondent's ethnic status (1 - White and 0 - Minorities) and

(8) GPA were obtained from the Registrar's Office. Previous studies have indicated ethnic status and GPA are important measures of the alumni's gift-giving behavior.

(9) Dollar amount of cumulative monetary contribution by the survey respondent was also obtained from the Alumni Record Office.

## MULTIPLE REGRESSION MODEL AND ASSUMPTIONS

Our hypothesis states that participation in the Cornell Tradition program significantly explains alumni's gift-giving behavior, while effects of other factors (employment status, salary level, graduate status, indebtedness level, motivation to give, ethnic background, and GPA) are accounted for. To test this hypothesis, the multiple regression model is presented:

$$Y = XB + E$$

Where:
Y is a 153 x 1 matrix (153 observations for one dependent variable);
X is a 153 x 9 matrix (153 observations for 8 explanatory variables and an intercept);
B is a 9 x 1 matrix (9 regression coefficients including the intercept coefficient); and
E is a 153 x 1 matrix of the random errors.

In order to apply the least squares regression model to our data, the following seven conditions are assumed to be valid:

(1) Y is a linear function of Xs.
(2) X matrix is full column rank.
(3) E is normally distributed with the mean = 0 and the constant, independent variance = $\sigma^2$.
(4) Xs are non-constant.
(5) Es are independent of Xs.
(6) Xs are measured without errors.
(7) All observations are equally influential and reliable.

Estimators of regression coefficients will be the best linear, unbiased estimators only when these assumptions are valid (Chatterjee and Hadi, 1988; Rawlings, 1988; Chatterjee and Price, 1977).

## ANALYSIS

### 1. Descriptive Statistics

Due to the pairwise deletion of the observations with missing values,

the number of the observations was reduced to 153 in total, 66 in the Tradition group and 87 in the Control group. Table 1 indicates simple mean comparisons between program participants and non-participants. As the program has intended, indebtedness level of the participants was significantly lower than the non-participants. The Tradition group was significantly higher than the Control group in terms of GPA and level of giving.

2. Regression Analysis and Validation of Assumptions

The original model did not successfully explain the variance of the dependent variable, as indicated by adjusted R square equal to 2.89%. Subsequent analyses of the residuals has detected the violation of normality and common variance assumption, as well as the existence of the six influential points. The five observations identified have contributed $200, $250, $319.87, $125 and $250 respectively to the University, whereas the average contribution of the remaining donors was only $32.5. The problem of the sixth observation is associated with the large self-reported indebtedness ($46,000). This is judged to be a measurement error, since the financial aid office usually does not encourage students to take loans of more than $20,000 in total. It was decided to exclude these six observations from the analysis to improve the fit of our regression model.

The assumptions of normal distribution and common variance of the errors are examined once again after the deletion of the six observations. The plot of the residual vs. fitted values (Figure 1) has depicted a typical fan-shaped pattern, which is commonly observed when the variance of error increases with the mean of the dependent variable. The square root transformation of the dependent variable is indicated as a possible remedy for both nonnormality and heterogeneous variances of residuals.

The regression summary table indicates that the model has failed to explain the data, even after the transformation. The close examination of the plot of residuals vs. predicted values has revealed intriguing insights into why the model could not explain the data adequately. As shown in Figure 2, two distinctively different patterns of the residuals have appeared. One pattern consists of the observations with positive residuals, which depict a random pattern of residual against predicted Y values. This indicates that the square root transformation was successful to correct the heterogeneous variance problem as for the positive residuals. The other pattern is made up of the observations with negative residuals. The magnitude of these negative residuals have linearly increased with the larger value of the predicted Y. The square root transformation did not work for this group. The observations with negative residuals are identified as those who have not given any monetary gifts to the University, whereas the observations with positive residuals are gift-givers. In short, the square root transformation of Y was successful only for non-zero Y values. It is indicated that the model may adequately fit only the data of the donors in our least squares analysis.

The data of the donors contains 46 observations. There are 21 alumni who received the Cornell Tradition Fellowship and 25 non-Tradition alumni. All regression assumptions associated with the random errors have finally become fulfilled. The model has explained more than 50% of the variance of

Y and F value is 6 (Table 2). The results lead us to conclude that the model has successfully accounted for the variance of the dependent variable. T tests indicated that each beta coefficient associated with ethnicity, indebtedness, graduate school status and GPA respectively, is significantly greater than 0, in the presence of other predictors. This means that the alumni, who have a non-minority background, less debt from undergraduate education, and lower GPA, and do not go to graduate school, tend to make more donations to the University. The results are in line with previous findings. White students may have been better integrated into the alumni organization and have had more frequent contact with the alumni society than the minority alumni. Those who have less in total loan amounts and/or do not go to graduate school are relatively better-off and therefore, tend to give more gifts to the University than those who are graduate students with heavy amounts in educational loans. It is rather surprising to see that lower GPA predicts more contribution. It could be reasoned that the alumni with higher GPA are either currently enrolled in graduate school or saving money to go back to school in the near future, either which may be preventing them from making larger donations. This interpretation may be particularly true for the young alumni, like our respondents, who graduated from Cornell only a few years ago.

The dichotomous measure of whether the person is a Cornell Tradition alumni or not did not explain the donation level very well. This indicates that mere participation in the program is not important. However, the loan reduction that the Cornell Tradition alumni have received through the program has proven to be significant in enabling them to be better donors.

## SUMMARY AND CONCLUSION

Ezra Cornell founded his university with a commitment to provide students with opportunities for work as well as for study. The alumni-supported Cornell Tradition Fellowship Program is a contemporary expression of the founder's vision. The program awards six hundred fellowships each year to undergraduate students who have demonstrated significant work experience, community service, and scholarly achievement. An award of up to $2500 a year will reduce by that amount the indebtedness a student may incur in obtaining the Cornell degree. The Tradition alumni are expected to provide the subsequent generations with job opportunities and financial support, and be actively involved in various volunteer activities.

The research study examined whether the alumni who received the Cornell Tradition Fellowship during their undergraduate years have made significantly higher monetary contributions to the University than the non-Fellows, while the effects of other variables (employment status, income, indebtedness level, GPA, ethnicity, graduate school attendance, motivation to give) were accounted for.

The initial run of regression resulted in 2.89% adjusted R square. The analysis of the residuals detected the serious violations of normality and common variance assumptions, as well as the existence of six influential points. The deletion of the five outliers and one observation with a measurement error did not improve the overall fit of the model. The plot of

the residuals against the predicted Y values depicted a typical fan-shape pattern, which indicated the transformation of Y as a possible remedy for nonnormality and heterogeneous variance of the errors.

The square root transformation of Y, however, was not successful at all, resulting in 0 adjusted R square. The close examination of the plot of residuals vs. fitted Y values revealed that the Y transformation was successful to correct the heterogeneous variance problem only for the positive residuals. But it did not effectively work for the negative residuals. The positive residuals were associated with the observations having positive Y values (in other words, donors) and the negative residuals were those with 0 values in Y (non-donors). This indicated that the model may adequately fit the donors' data only.

The modified model successfully explained more than 50% of the variance of the donors' data. F value was nearly 6. All the basic assumptions were proven to be valid. The best linear, unbiased estimators were finally obtained. Ethnicity, indebtedness, graduate school status, and GPA are identified as significant factors in predicting gift-giving level of donors. The alumni who have a non-minority background, less debt from undergraduate education, lower GPA, and do not go to graduate school, tend to make more donations. The dichotomous measure of whether the alumni was a Cornell Tradition Fellow or not, did not explain the donation level well. This implies that it is not mere participation in the program, but the loan reduction that the Cornell Tradition alumni received through the program, that enables them to be better donors. This finding has lead us to conclude that the Cornell Tradition Program has been successful in cultivating more committed alumni through the implementation of the reduction of undergraduate loans.

Table 1

MEAN COMPARISONS
CT PARTICIPANTS VS. NON-PARTICIPANTS

| Variables | Participants | Non-Participants | T-test |
|---|---|---|---|
| Debt | $7,674 (5,971) | $10,649 (4,385) | p<.0001 |
| Employment | 0.833 (.376) | 0.724 (.450) | n.s. |
| Grad School | 0.258 (.441) | 0.356 (.482) | n.s. |
| Salary | $17,464 (10,609) | $15,058 (11,101) | n.s. |
| Motives | 1.788 (.621) | 1.793 (.667) | n.s. |
| Ethnic | 0.818 (.389) | 0.793 (.407) | n.s. |
| GPA | 3.129 (.387) | 2.918 (.462) | p<.005 |
| Giving | $25.73 (57.73) | $10.82 (31.96) | p<.05 |

Entiries are means
( ) Entries are Standard deviations

Table 2

| Source | SS | df | MS | F-value |
|---|---|---|---|---|
| Regression | 103.8601 | 8 | 12.9825 | 5.995 |
| Error | 80.1225 | 37 | 2.1655 | |

| Variables | Beta | S.E.(Beta) | T-value |
|---|---|---|---|
| Constant | 15.8119 | 2.7663 | 5.716 |
| Ethnic | 1.5193 | 0.686 | 2.215 |
| CT Prog. | 0.4515 | 0.5747 | 0.786 |
| Debt | -0.0002 | 0.0001 | -3.191 |
| Grad School | -2.4875 | 0.8025 | -3.100 |
| Employment | -1.0056 | 1.0423 | -0.965 |
| Attitudes | 0.001 | 0.3757 | 0.003 |
| Salary | 0 | 0 | -0.199 |
| GPA | -2.6864 | 0.7132 | -3.767 |

Plot of Externally Studentized Residuals vs. Fitted Values:

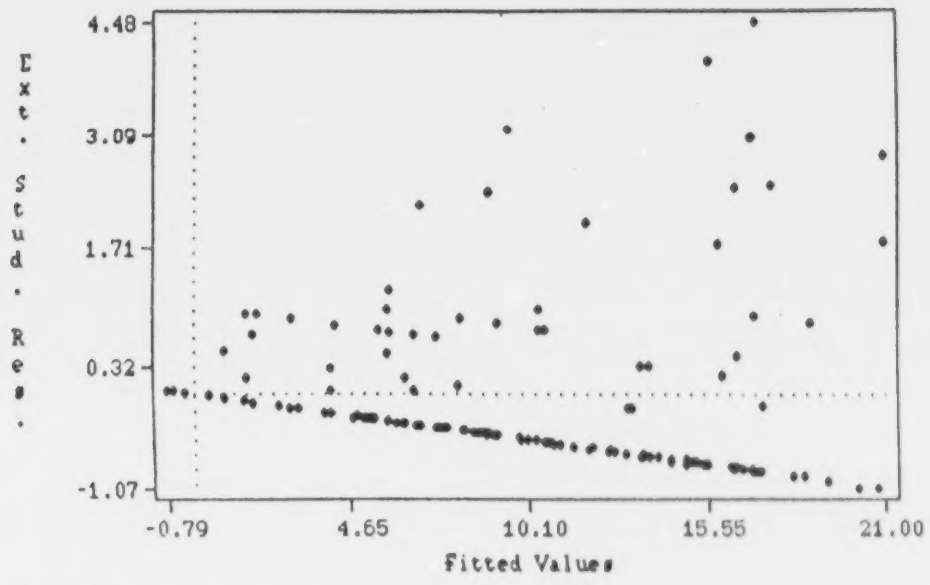


Figure 1

(N=147)

Plot of Externally Studentized Residuals vs. Fitted Values:

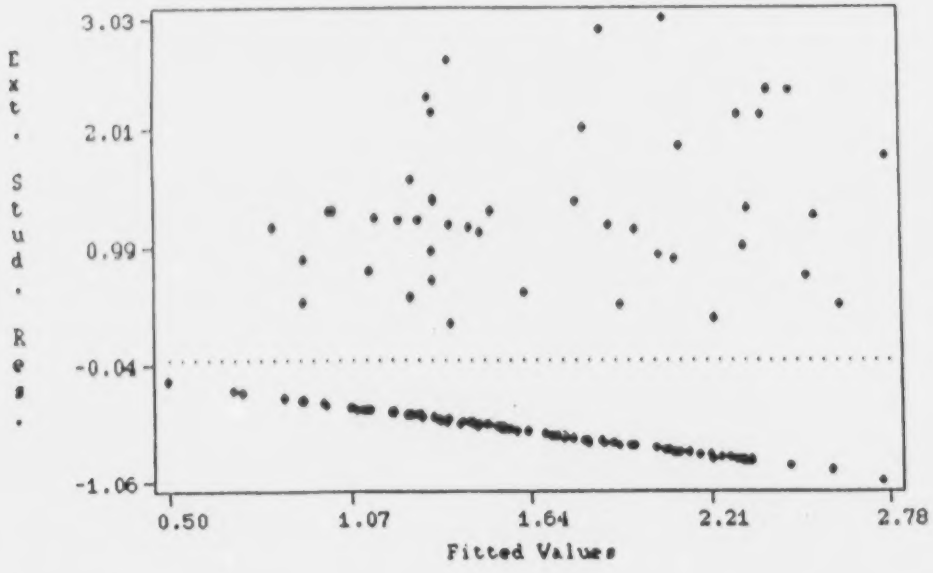


Figure 2

(N=147) after Y Transformation

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# The Top of the Funnel: An Initial Analysis of an Inquiry Population

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The college selection process includes inquiry, application, acceptance, and matriculation. Of these, the largest and least studied group is the inquiry population. These are the prospective applicants who request information and/or an application from the institution. Some of the inquiry pool will apply, however a large proportion of them will not submit a formal application.

Not all inquiries are expected to apply. Self-selection is an integral part of the college choice process. But many administrators and researchers wonder why large groups of students, who are qualified, never even submit an application. They ponder this question because quite often the students who do not submit an application fit the profile of students who do apply, are accepted and thrive at the institution.

Students will choose where they apply based on objective factors such as size, location, cost and acceptance rate of graduates into professional schools. There are, however, less tangible factors which cannot be easily defined or articulated by students. Some of these include academic reputation, student life, faculty-student relationships, and social awareness. These are factors which can be elaborated upon through publications and other initial contacts with students. Indeed, one of the driving forces behind the current study was a need to identify which factors, both objective and subjective, were preventing students from applying.

The survey questions evolved from a series of discussions with the associate directors in the admissions office. We wanted to keep the survey as brief as possible, assuming students might take a limited amount of time to provide us with information, but we did not want to risk alienating them with a lengthy survey.[1] Thus, the admissions associates were a terrific resource as they had already done some preliminary qualitative research on the topic through their discussions with potential applicants. In addition, we learned that the admissions database would provide some data on all inquiries. In some cases the information was limited to just name and address. For others we had SAT scores, estimated financial aid need, and high school information. Unfortunately, we had this expanded set of data on a very limited number of individuals. With the further limitation of our sample and response rate, the additional data on file was virtually unusable for this study.

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1 We reminded ourselves frequently that the population had lost interest in our institution very early in the process.

Our main objectives in conducting this study were threefold: 1) to learn how our academic reputation is perceived in relation to our competitors by the inquiry population; 2) to determine how much of a factor cost is in student's decisions not to apply; and 3) to learn where students are applying.

## METHODOLOGY

A simple one-page, two-sided self mailing survey was designed.[2] The survey contained approximately 65 variables which included possible reasons inquirers decided not to apply to Tufts, the reasons they did apply to their top choice school, the reasons they did not visit our institution, questions regarding whether or not they visited the institutions to which they applied, whether or not they applied for financial aid, and background variables such as gender, ethnicity, type of high school, high school rank, test scores, and the influence of twelve institutional contacts on their impression of Tufts.

The inquiry survey was sent to 5000 students who did not complete an application as of the January 3 deadline. The surveys were mailed immediately after this deadline had passed. This represents approximately 12% of the total inquiry population. In order to better understand the African American and Hispanic inquiry populations, the sample was stratified to include 1000 students who identified themselves as being from either of these groups.

## RESULTS

### Response Rates

Four-hundred and ninety surveys were returned in usable condition for a response rate of approximately 10%. Survey demise may be partly responsible for this low response rate as many surveys were tattered from their two-way unprotected journey across the country and back. Despite our efforts to gain a better understanding of the African American and Hispanic population, the response rates from these populations were about the same as for the general population, yielding 4% and 6% respectively.

### Academic Reputation (see figure 1)

Academic reputation was cited as a reason for not applying to Tufts by only 16% of the respondents. On the flip side, 72% cited academic reputation as a reason they did apply to their first choice school. When considering those students who were probably qualified to attend Tufts (based on our limited information) we roughly divided the group into high SAT scores (combined scores 1200 or greater) and low SAT scores (combined scores 1199 or lower). We found that our reputation was a factor for a greater percent of the high scoring students than low scoring students in their decision not to apply to Tufts. Moreover, for both high and low SAT inquirers, academic reputation was the most frequently cited factor in their decision to apply to their first choice school.

### Cost as a Factor (see figure 1)

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2 A copy of the survey instrument can be found in Appendix A.

Thirty-four percent of the respondents cited cost as a factor in their decision not to apply to Tufts. Thirteen percent cited this as a factor in their decision to apply to their first choice school. Most importantly, the cost of attending Tufts was cited by a higher percentage of respondents than any other variable on the survey. It was not a major factor in student's decisions not to visit the campus as only 5% indicated such.

Competitors

The list of competitors provided some interesting insights, especially when considering those students who cited cost of attending as a reason they did not apply to our institution. These students were likely to apply to institutions whose on-paper cost was similar to that of Tufts. The top ten group of competitors for student who were concerned with cost was virtually identical to the top ten for the entire population. The one exception being that their list included three of the "public ivies".

Overall, the top ten competitors at this stage were identical to our top ten competitors at the application, acceptance and decision stages.

Other Interesting Results

Results also demonstrated that some students did a fairly accurate job of self-selecting themselves out of the applicant population. A fair percentage of students who chose not apply to Tufts had dangerously low SAT or ACT scores.

Two years ago the decision was made to eliminate on-campus admissions interviews and replace them with local area alumni interviews. Much discussion and some dissention existed on this issue from many constituencies. Based on the reactions from the inquirers, it seems that the absence of on-campus interviews was not an influential factor in students' decisions not to apply (as only 3% indicated it to be a reason at all).

Finally, the results provided some insight on the impact of institutional contacts on student's impression of Tufts. Few pursued any contact beyond receiving the application and viewbook. Those who did have a more intimate contact with the institution generally found the connection to be a positive experience.

DISCUSSION

It was difficult to predict what response rate we might realize. Although we had hoped for more, we received the 5% we had predicted. We were fairly certain that we wouldn't be competing with other inquiry surveys, an issue in the return rate for accepted applicant surveys. We can only guess as to what might have contributed to the low response rate. As we mentioned earlier, the physical construction of the instrument may have been a contributing factor. Students disinterest in our institution probably was a major factor in their unwillingness to respond.

We were disappointed in the low response rate for the African American and Hispanic students. Over sampling these populations did not markedly improve the response rate.

Many respondents stated that they did not apply because they had been accepted as an early decision candidate at their first choice school. Most often these schools were our top competitors at any given stage in the college selection process. Many of these stated that they would have pursued their application to Tufts had they not been accepted to an early decision school.

It appears that students view our academic reputation as being good, but not as good as our top competitors. Our academic reputation does not seem to be a factor preventing applications from top students, but it is a factor that entices students to apply elsewhere. This is especially true for those students with SAT scores in the 95th percentile. This confirms what we have learned from more extensive investigation into this with non-matriculating accepted applicants. It's not that they do not like us, but rather that they like others better.

In our own surveys of accepted applicants we found that cost was not a factor in students' decisions to attend or not attend Tufts. We had suspected that cost was a factor at some point in the college selection funnel. Our suspicion was confirmed upon discovering that cost of attending was cited by the highest percentage of respondents as their reason not to apply to Tufts. More than one-third of the inquirers indicated this as a factor. It was surprising, however, to discover that the students who did cite cost as a reason not to apply to Tufts were still applying to schools which had similar or higher costs. Perhaps what we are seeing here is a combination of cost and academic reputation - students are willing to finance a very expensive education at a school they consider to have the greatest academic reputation.

Some of the questions used were found to be ambiguous in analysis. We cannot emphasize enough the benefit of pilot testing. Items 2.6 (academic rigor) and 6.8 (good chance of acceptance) are not as useful as they can be. The interpretation can fall to one side or the other. For example, when respondents indicated they did not apply to Tufts because of "academic rigor" was that because they perceived us as being too rigorous or not rigorous enough? The same dilemma exists when considering the "good chance of acceptance" item.

## CONCLUSIONS

This was an experimental format for us - the one sheet self-mailer. We were pleased with the cost saving aspects, but in the future will use a sturdy card stock and different instructions or supplies for securing it closed for the return trip. Too many surveys were returned to us in postal service "body bags".

It appears that there is much for an institution to learn about how it is perceived in its initial contact with students through doing an inquiry study. Survey design and delivery are keys issues, as there is limited space and attention time. In anticipation of low response rates, a large number of surveys should be mailed.

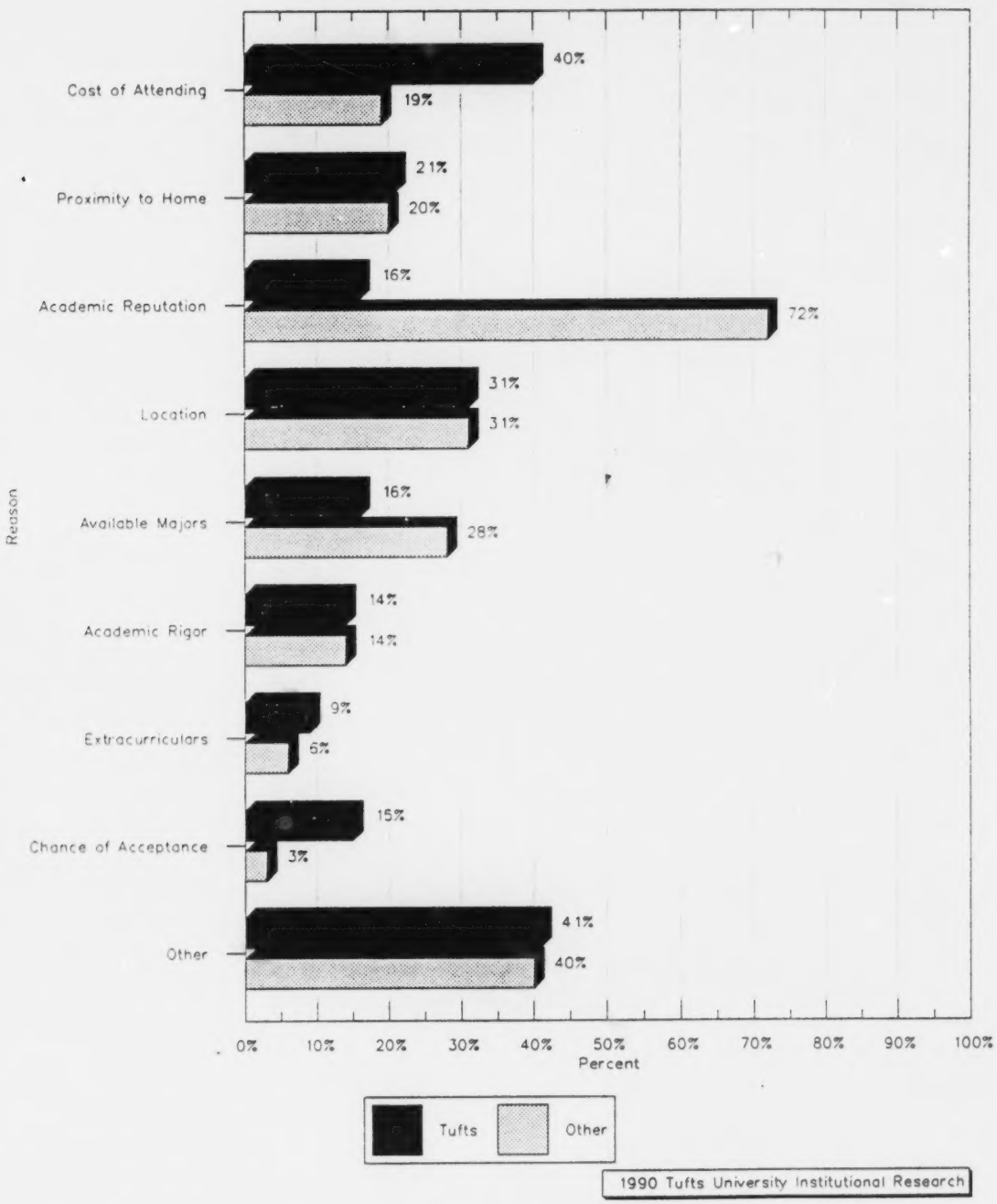
Our study served mostly to confirm our opinion as to why students did not apply. The information gathered has been useful both internally and externally. It has made us aware of the need to conduct additional research in this area. Questions we hope to pursue in the future include:

1. *How do inquirers perceive Tufts' academic reputation?*
2. *What factors contribute to our academic reputation?*
3. *What additional information do inquirers want to receive?*
4. *How are inquirers calculating cost?*

5. *Do inquirers factor in the possibility of receiving financial aid when they calculate the cost of attending?*

# FIGURE 1

**Reasons They Did Not Apply to Tufts vs Reasons They Did Apply to First Choice School**



INSTITUTIONAL RESEARCH
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# TUFTS UNIVERSITY
# ADMISSIONS INQUIRY QUESTIONNAIRE 1990

**We were pleased to respond to your request for an application for admission and information about Tufts University. Our records show that you have not submitted an application for admission. We are anxious to supply prospective students with information that is important and helpful to them. Therefore we ask you to take a few minutes to answer the questions below and return this postpaid card to us. I hope your college selection process has been interesting and rewarding. Best wishes for every success in your future endeavors.**

**David D. Cuttino, Dean of Admissions**

**1. Did you apply for admission to any college or university during this past year?** ___ Yes ___ No

If you answered "yes" please complete the remainder of the card. If you answered "no" please briefly explain why you didn't apply, and return the card without answering the remaining items.

_____

**2. In the left hand column indicate up to three reasons why you decided not to apply to Tufts. In the right hand column please indicate up to three reasons why you applied to the school you would most like to attend.**

| Tufts | | Your First Choice |
|---|---|---|
| ___ | 1. Cost of Attending | ___ |
| ___ | 2. Proximity to Home | ___ |
| ___ | 3. Academic Reputation | ___ |
| ___ | 4. Location | ___ |
| ___ | 5. Available Majors | ___ |
| ___ | 6. Academic Rigor | ___ |
| ___ | 7. Extracurricular Opportunities | ___ |
| ___ | 8. Good Chance of Acceptance | ___ |
| ___ | 9. Other _____ (specify) | ___ |

**3. If you did not *visit* Tufts, please indicate below up to two reasons why you did not visit.**

___ 1. Distance (too far away)
___ 2. No on-campus interview available
___ 3. Tufts was not a primary choice
___ 4. Already well informed
___ 5. Cost of visiting
___ 6. Cost of attending
___ 7. Other (Please specify)_____

**4. Please use the space below to list in order of your preference up to five colleges or universities to which you did apply for admission during the past year. Please also indicate whether or not you visited each institution and whether or not you applied for financial aid.**

| College/University | State | Visit? | | Apply For Financial Aid? | | LEAVE BLANK |
|---|---|---|---|---|---|---|
| First Choice | | Yes | No | Yes | No | |
| Second Choice | | Yes | No | Yes | No | |
| Third Choice | | Yes | No | Yes | No | |
| Fourth Choice | | Yes | No | Yes | No | |
| Fifth Choice | | Yes | No | Yes | No | |

5. **Are you planning to enroll in a college or university in the fall of 1990?** ___ Yes ___ No

6. **Your gender:** ___ female ___ male **Ethnicity:** _____

7. **Type of high school from which you will be graduated:**

___ 1. public
___ 2. private
___ 3. Catholic (private)
___ 4. Other denominational (private)
___ 5. Other (please specify_____

8. **Approximately where do you rank in your high school class?**

___ 1. top 2%
___ 2. top 3-5%
___ 3. top 6-10%
___ 4. top 11-20%
___ 5. top 21-30%
___ 6. top 31-40%
___ 7. top 41-50%
___ 8. lower than 50%

9. **If you took the SAT and/or ACT, please fill in your scores.**

_____ SAT Math _____ SAT Verbal _____ ACT Composite

| 10. What influence did the following have on your impression of Tufts? | Strongly Positive | Positive | Neutral | Negative | Strongly Negative | Not Applicable |
|---|---|---|---|---|---|---|
| 1. Your telephone calls to Tufts' Admissions Office. | | | | | | |
| 2. Your telephone calls from Tufts students. | | | | | | |
| 3. Information in admission related mail. | | | | | | |
| 4. Visit to Tufts campus. | | | | | | |
| 5. Timeliness of admission related mail. | | | | | | |
| 6. Student/Parent meeting in your local area. | | | | | | |
| 7. Information on Tufts in the local and/or national news. | | | | | | |
| 8. Video about Tufts. | | | | | | |
| 9. Contact with Tufts faculty or coaches. | | | | | | |
| 10. Local college night. | | | | | | |
| 11. Formal tour of Tufts. | | | | | | |
| 12. Admissions office orientation meeting. | | | | | | |

THANK YOU FOR YOUR TIME AND EFFORT! PLEASE FOLD THIS CARD SO THIS SIDE IS DISPLAYED.
SECURE THE CARD CLOSED WITH THE ADHESIVE DOT TO THE RIGHT. NO STAMP IS NECESSARY.

**BUSINESS REPLY MAIL**
FIRST CLASS MAIL PERMIT NO. 3696 BOSTON, MA
POSTAGE WILL BE PAID BY ADDRESSEE

INSTITUTIONAL RESEARCH
TUFTS UNIVERSITY
28 SAWYER AVENUE
MEDFORD, MA 02155

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

# The Use of Structured Interviews in a Qualitative Study of Admissions Publications

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## Introduction

As the number of traditional college-aged students declines (WICHE, 1988), competition among colleges for these students is stiffening and will continue to do so for the foreseeable future. A Vice-President for Enrollment at a major university predicts that "fewer student prospects will result in recruitment wars" among colleges (Elliott, 1990). With tuition now increasing at a slower rate than in past years (Evangelauf, 1989, 1990), possibly limiting the financial resources available to spend on recruitment, Admissions Officers are under more scrutiny and pressure to become more efficient. Admissions Officers are more frequently being asked to evaluate the relative success of their various recruiting strategies and to redirect funds from the less effective methods to those methods that are more effective (Elliott, 1990). Admissions Officers are increasingly relying on Institutional Research personnel for support in planning and conducting these evaluations.

Recently, the Admissions Officers at the researcher's institution asked the author to assist in the development of a new viewbook intended primarily as a search piece. Because a length of time had passed since the last major revision of these publications, it was decided that research addressing students' preferences was needed before the publication could be created. The author conducted individual interviews with high school and college students to determine what they do and do not prefer regarding the covers and the contents of Admissions publications.

The purpose of this paper is twofold: first, to illustrate that qualitative research (in this case individual interviews) can be a valuable tool in the evaluation of printed Admissions literature, and second, to share the findings (students' preferences) from conducting 25 such interviews. In these dual purposes, this study differs from a quantitative study in which the results are typically of the most interest to the reader. Since there are very few opportunities within the Admissions field to employ a true experimental design (e.g., to measure yield resulting from the presence vs. absence of a viewbook or different versions of a viewbook), the establishment of an acceptable method for reviewing Admissions literature, as this study will do, is as important as are the actual results regarding student preferences for Admissions publications.

## Review of Literature

### Importance of Printed Admissions Literature

Most people, both in the Admissions field and outside of it, would agree that using printed Admissions literature (viewbooks, pamphlets, catalogs and factbooks) is a recruitment strategy that will continue to be used for many years. Of all of the strategies for recruiting students that have evolved over time (e.g., visiting high schools, inviting students to visit the college, writing to parents, having alumni or current students telephone potential applicants, college fairs, and videotapes), describing the college in writing to prospective students has endured. One difference between printed literature and other methods is that printed materials are permanent documents to which the student can refer repeatedly whereas videotapes, telephone calls, and visits to the high school or the college campus can be more transient. There have been some recent developments in the uses of printed literature, however. For example, mass mailing to high school students who do not request information is a newer practice than mailing only to those students who request information about a college. Nevertheless, the practice of describing the institution in writing has been established for many years.

There is evidence that students' interest in videotaped descriptions of colleges has faded. One researcher explains the demise of videotapes and other media in the following way, "Technology has allowed higher education to use Madison Avenue techniques such as direct mail, film, television, and cassette recordings. This mass media approach worked well in the '80s, but because more institutions are using these techniques [now], they are less effective" (Harris, 1990). Looking toward the future, one researcher predicts that as college budgets tighten and the costs for Admissions personnel to travel to

potential applicants increases, Admissions Officers will depend more heavily than ever on mailing printed materials to prospective students (Chapman, 1981).

To the institution, the viewbook can be one of its most versatile marketing instruments. Compared with other factors that students cite as important when they are selecting a college or university such as academic reputation, quality of faculty, placement rates of graduates in graduate schools and jobs, and the size of the institution, altering a viewbook is more practicable, less expensive and can be accomplished more quickly than altering, for example, a college's academic reputation. The other factors that students cite are relatively fixed attributes whereas how an institution chooses to portray or market itself in a viewbook is more easily modified (Chapman, 1981). Developing a new viewbook or revising an existing one and disseminating it to potential applicants is also less expensive that creating or revising and distributing a videotape of the college.

Typically a viewbook can last, with minor changes and updates, for multiple Admissions cycles and cohorts of students. An extremely large volume of viewbooks is distributed every year (the number of viewbooks distributed by one institution in a single year can be as high as 100 times the number of new freshman the institution intends to enroll), at substantial cost.

**Past Studies**

There have been a number of studies comparing the importance of printed literature relative to other recruitment strategies which have come to differing conclusions. A 1980 study conducted at UCLA (reviewed by Litten and Brodigan, 1982) asked college students to rate the relative importance of various information sources. They found college publications ranked second in importance after parents or immediate family members and above college representatives, current college students, and college counselors.

A 1975 study (also reviewed by Litten and Brodigan, 1982) of high school seniors found that requested college catalogs were the most frequently mentioned sources of information. Following requested catalogs (in descending order of frequency) were: campus visits, college counselors, unrequested college catalogs, college students, college representatives, parents and friends. This study, in addition to others, makes the distinction between solicited and unsolicited literature. High school and college students placed greater weight on the solicited literature than on the unsolicited. This means that the same viewbook will be received differently depending on whether the reader requested the catalog or not.

Kellaris and Kellaris (1988) surveyed all first-time students (freshmen and transfers) at a church-affiliated institution. In a pen and paper survey, students rated the influence of ten different personal and non-personal contacts they might have had with the college on a 5-point Likert scale (from "Strong" to "No Influence"). They found mailings of printed literature second only to an individual campus visit in influence and more influential than (in descending order of influence): a group visit to campus on "Campus Visit Day", telephone calls from current students, attending a campus event, visits from a college group, Admissions Officer visits to high schools, presentations about college at church, magazine ads, and radio ads. An important finding in addition to the relative influence of different contacts was that 25% of current freshmen did not make an individual campus visit and that 50% of the class did not attend the "Campus Visit Day", while over 90% of the class received the printed literature.

In contrast to the above findings, interviews with freshmen at a state university in 1979 suggested that students paid more attention to cost, where their friends went to school, and the availability of certain programs than they paid to printed Admissions literature (reviewed by Chapman, 1981). In this study, students described their use of printed materials as primarily to bolster impressions they had already formed and decisions they had already made. It may be true that students interested in different categories of institutions (community colleges vs. state universities vs. small, private liberal arts colleges) use printed materials in different ways. Finally, a 1986 Carnegie Foundation study of high school seniors found that college publications were "the most frequently used but least relevant and least accurate sources of information about colleges" (reviewed by Strayer, 1988).

While there are studies comparing the efficacy among different recruiting methods (printed literature vs. telephone calls vs. campus vists), there is very little information comparing the relative success of different strategies within one medium or comparing the relative success different institutions

have within one medium. The Admissions Marketing Report, The National Newspaper of Admissions Marketing, runs an annual competition among Admissions publications. However, winning publications are judged by people outside of higher education (publishers, editors, and creative directors of advertising agencies) based on idea concept and creativity, not on the yield in terms of numbers of new freshmen. The author would venture to guess that Admissions Officers would vote for a significantly different group of winning viewbooks than do the advertising personnel.

From this researcher's examination of more than 100 Admissions pieces, there are very distinct types of viewbooks and different strategies used in them. Some cover types could be described as traditional (a picture of the most distinguished campus building with or without students), humorous, artistic/creative, and intellectual. The content of viewbooks vary along the following dimensions: organization (magazine-like, question and answer, headings), tone (serious vs. humorous), proportion of photographs to text, length (pages), point of view (students' vs. colleges'), and typeface.

Given the importance of the viewbook and other printed literature, there is surprisingly little information about what differentiates a "good" viewbook from a "poor" one. One reason for lack of data is the competitive nature of the Admissions business. Another reason is the fact that institutions typically contract out the research for and production of a viewbook to consultants. These findings are proprietary and are shared only between the client and consultant. Chapman (1981) adds another observation: until recently, Admissions Officers have had to focus their efforts primarily on the **selection** of students rather than upon the **recruitment** of students.

**Choice of Qualitative vs. Quantitative Research**

Higher education personnel are just beginning to borrow from private industry by recognizing the value of quantitative research in the student recruitment and retention fields, among others. By using focus groups with students to evaluate her institution's publications and to learn more in general about the college selection process, a researcher from the University of Miami reported a doubling in the response to her institution's Student Search mailings (Bonnett, 1987).

Since 1983, Washington University in St. Louis has annually conducted focus groups and/or quantitative surveys evaluating their Admissions literature. Researchers there routinely conduct multiple focus groups with high school students in different regions of the country to pre- and post-test their Admissions materials relative to materials from other colleges. Washington University has found consistent results between the qualitative and quantitative studies. The qualitative research has more than paid off. In one instance, the institution redesigned its viewbook in a more humorous, "playful" tone, then found in focus groups that it was not well-accepted by high school students. The research revealed that students viewed the college selection process in a more serious manner than the university realized. Once Washington University redesigned the viewbook to match prospective students' more serious tone, they reported an increase in applications from better students (reviewed by Bonnett, 1987). While the results of Washington University's research are primarily intended for internal use, Washington University does share results with a somewhat wider audience (Benson, 1986, 1989, and 1990). The main purpose of the focus groups is to evaluate the success of Washington University's publications relative to other institutions' pieces, however, some general statements regarding students' preferences are included.

A qualitative research design was chosen in the current study for a number of reasons. First, since the College had not recently examined students' preferences for Admissions literature, and since those preferences are volatile (Bonnett, 1987) this project was viewed as an exploratory phase. Since the College did not know students' priorities in Admissions literature (due to the lack of institution-specific research and the lack of more general information on the subject) the researchers determined that writing an effective quantitative survey questionnaire would be imprudent at this stage. A quantitative survey was not ruled out for a later stage, and the outcomes of the interviews will be extremely helpful in writing that instrument. Another reason for choosing interviews over a survey was to re-familiarize persons on campus with the institution's "market" and the language students use to describe this college in particular and the college selection process in general. One researcher found that college catalogs from all types of institutions (non-selective, very highly selective, 2-year, 4-year, public and private) are written above the student readers' level of understanding and use terms with which many college-bound high school students are not familiar (Chapman, 1981).

The trade-off with using interviews rather than a survey of a statistically valid sample of students is the loss of the ability to accurately project the proportion of students preferring one strategy or type of viewbook over another (Goldman and McDonald, 1987). At this early stage in the development of a new viewbook, the researchers were more interested in the reasons driving students' preferences and the images of institutions created by different styles of books than measuring the degrees of those preferences.

**Choice of Focus Groups vs. Individual Interviews**

Focus groups are more efficient, both cost- and time-wise than individual interviews. They also allow for interaction among the participants whereas one-on-one interviews do not. Some researchers state that the synergy among the participants in a focus group lends more information than would the sum of individual interviews with the same number of people (Goldman and McDonald, 1987). In most instances, market researchers prefer conducting focus groups over individual interviews. In this case, the choice between focus groups and individual interviews was constrained by the participants' task of reviewing and ranking 30 different viewbooks. This task would not have been possible in a group interview of 8 to 10 students.

## Methodology

**Sample**

Twenty-five structured interviews were conducted from July 2 through July 6, 1990 with high school and college students who were on campus for various Summer programs. Respondents included 8 participants in the Johns Hopkins Center for Talented Youth (CTY) Program in which intellectually gifted high school students took courses at the college, 8 Resident Assistants for the CTY Program who were college students at many very highly selective institutions located across the country, and 9 upperclass college students who were on campus in internship programs. The high school students were screened and only those actively in the college selection process were included. The sample was balanced by gender.

**Method**

40 recruitment pieces (brochures, viewbooks, and pamphlets) were selected from a larger group of over 100 publications to illustrate different styles of covers, themes, sizes, and orientations. The materials were all current, having been mailed to inquirers in the past academic year. The materials were divided into four groups of ten books, balanced by length of the piece, the prestige of the institution, and the style of the cover. Each participant was randomly assigned to an experimental group determining which combination of three groups of materials he/she would see.

The interviews were structured and followed an outline. Earlier questions were general and later ones were more specific. Topics that the participant did not discuss spontaneously were probed by the interviewer. During the 45-minute interviews, respondents were first asked to ignore any prior knowledge or impressions they may have had of each institution represented and to base their responses on the literature from that institution only.

Viewers examined in total the covers of 30 pieces and the contents of a subset of 6 of these pieces. Participants were asked to select three most preferred and three least preferred books out of 30 based on the **covers** of the books alone, and were then asked to discuss his/her reasons for the preferences. Next, participants were asked to quickly skim (not read) the content of six books and to select his/her one preferred and one least preferred book based on their **content**. Reasons for students' preferences regarding the contents of viewbooks were collected. 30 viewbooks were shown 19 times each; the remaining 10 books were shown 18 times each. Materials from the researcher's institution were **not** shown. Following the same interview outline, two different persons conducted the interviews. Interviews were audio tape-recorded and later transcribed.

## Findings

The scope of the findings in this study is narrowed to students' opinions of the covers of viewbooks and the layout and organization of the content of viewbooks. Before discussing the findings in detail, it should be noted that they are based on a subgroup of students already attending or planning to attend very highly selective colleges and universities. This sample's preferences may not generalize to students

interested in other types of institutions. Another important caveat is that these findings are students' self-reports of the likelihood of an action (e.g., picking up a viewbook based on its cover, continuing to read a viewbook based on the content's layout and "look"), not students' actual behavior.

**A. Preferences for Covers of Viewbooks**

The frequency with which each publication was most preferred and least preferred was tabulated. By comparing the six most preferred covers to the six least preferred covers (i.e., the best of the group to the worst), some interesting differences emerged which are discussed below.

**Heft.** The most preferred group had "heft". The two most preferred viewbooks contained 60 and 70 pages. One book in the preferred group had a binding with the name of the school; all others were stapled. In contrast, the least favorite group included shorter pieces; some were one page folded in thirds, one was a small poster folded, another was six pages long.

**Amount of Photographs.** The group of preferred covers had a larger proportion of the covers devoted to photography than did the least preferred group. A number of them had what viewers described as one "Absolutely beautiful" and "Gorgeous" color photograph which filled the entire cover. In contrast, in the least preferred group, computer graphics, slogans, borders, and the name of the college were more prominent than any photographs on the cover.

**Content of Photographs.** The content of the photography differed between the two groups of viewbooks as well. The preferred group included outdoor photographs of activity, often students walking, talking, or bicycling on campus. The photographs appeared to be unstaged "candids" and the students did not look into the camera. The people were small in these photographs; the focus was on the campus more than the people in the picture. The viewer could not see the faces of a many people in these photographs. Of the faces one could see, only a few were smiling. In contrast, the least preferred covers had indoor photographs of people who were posing for and smiling into the camera. More than one viewer called the people on these covers "models" rather than "students". The person was the focal point of the photograph, in fact, there was no background in these photographs. As one viewer stated, "It looks as if these pictures were taken in the photographer's studio, not on a college campus". The models on the least preferred covers were not active; they were simply standing and looking into the camera.

**Color(s) of Cover.** Due to the outdoor content of the photographs on the preferred covers, this group of covers contained natural colors (many greens and browns). In addition, they were matte finished and did not reflect light. Of the least preferred covers, one contained shades of grey and black, one was purple and teal, one was bright white and they were glossy and did reflect light. Even though the covers of the preferred group portrayed more activity, they were described as "quiet" and "peaceful". The least preferred group, although showing no motion, were called "loud" by students.

**Print/Typeface.** The typeface on the preferred covers was described by students as "traditional", "standard", and "like what you'd see in a textbook". The full name of the institution was in large print and appeared at or near the top of the page. On the least preferred covers there was an assortment of typefaces: italics, script, tall and narrow letters, and text printed on a curve rather than on a straight line. In this group, some of the names of the institutions were at or near the bottom of the cover. One cover did not show the name of the college at all (the reader had to open it up to find it); on another, the name of the school was abbreviated to its initials.

**Amount of Text on Cover.** Other than the name of the college, there was either no text or very little text (a phrase at the most) on the covers of the preferred viewbooks. There were sentences and sometimes paragraphs of text on the least preferred covers.

**Size and Orientation.** The four most preferred covers were 8 and 1/2 " by 11" in size and vertical in orientation. None of the least preferred group were this size or shape. Most of the latter group were larger than 8 and 1/2" by 11" and either square in shape or taller and/or narrower than 8 and 1/2 " by 11".

**Prestige.** Although students were asked to ignore the name of the school and what they might know about the institution, the group of preferred covers included viewbooks from some of the most prestigious

institutions included in this study (including the book from the one Ivy League school in the study). The least preferred group was made up of viewbooks from the lower prestige schools. (The definition of prestige is the author's own classification of all viewbooks into high, medium, and low prestige categories.) Whether the students' preferences were driven by prior knowledge of the institution or whether the prestigious institutions had, in fact, more attractive Admissions pieces is beyond the scope of this study. It is encouraging, however, that the viewbook from one of the most prestigious institutions in the group was not once selected as a most or least preferred cover. This led the researcher to believe that a student's prior knowledge of the prestige of the school would not outweigh his/her preference for its cover.

In summary, the elements of the most frequently preferred covers of viewbooks were: colorful photographs, outdoor settings, unposed photographs of active students, attractive views of the campus either as the background or the focus of photographs, matte finish, text that is printed in traditional font, large clear easy-to-read names of colleges near or at the top of publications, 8 and 1/2" by 11" size, and vertical orientations. In general, students preferred "simple" covers over "busy" ones. These findings were consistent with those of other researchers (Benson, 1986, 1989, 1990). See Table 1 for a summary of students' preferences for covers.

**B. Preferences for Contents of Viewbooks**

Turning now to the content of viewbooks, those attributes that differentiated the most preferred books from the least preferred ones in students' opinions will be examined. By again comparing those books that were clearly preferred to those that were not preferred on the basis of content, one can examine students' priorities and expectations.

**Organization.** All of the preferred books were arranged in a Question and Answer format. The remaining books employed headings to divide different sections such as "Faculty", "Students", and "Resources".

**Ratio of Text to Photographs.** The books preferred on the basis on content were balanced in terms of the ratio of text to photographs. In one case, the ratio was exactly 50:50 (according to space allotted) since for every one page of text the facing page was entirely photographs. Of the least preferred books, one consisted primarily of photographs with a very little text on each page. The majority of a second unpreferred book was text with very small black and white photographs.

**Length.** The preferred group of books included a mixture of different lengths (ranging from 13 pages to 32 pages). The least preferred viewbooks were shorter; all were under 14 pages. Students called the shorter books "flimsy" and assumed "there's no information in there". Unfortunately, none of the very long viewbooks (60 and 70 pages) was included in the group of viewbooks whose contents were reviewed, so students' preferences for the very long books are not known. Organization (a table of contents or headings) was related to overall length. As long as readers could identify sections irrelevant to them and could skip over them, they did not mind a large number of pages. There was a mixture of book sizes (8 1/2" by 11" and others) in both the most preferred and least preferred groups.

**Point of View.** The preferred books included a balance of student point of view or opinion and objective information about the college. Some books achieved this balance by including quotes about life at college by students (usually in captions of photographs); another included articles written by students (identified as students with by-lines). The least preferred group included one book that contained personal information (name, major, career plans) about a handful of students and very little objective information (only a fact sheet at the end) about the college. Another least preferred viewbook contained all objective information about the college and did not include any quotes by students.

**Print/Typeface.** The preferred books had large type and looked easy to read to the students who skimmed them. The least preferred books had small type which the viewers expected would be "boring, like a text book". One book had more captions (in small print) than text on each page. Students recognized and appreciated efforts by the writers of these publications to make the contents more engaging through variety, photographs, and captions. They disliked books that used the same layout on each page.

In summary, the most preferred attributes of viewbook contents included organization, a balance of text and photographs, moderate length (not too short), a balance of students' opinions and objective

information, and large and easy to read typeface. These findings were consistent with those of other researchers (Benson, 1986, 1989, 1990). See Table 1 for a summary of students' preferences for content. An additional point on content--all of the viewbooks reviewed for content in this study were commended by students for including a fact sheet or summary at the back of the book. While the presence of a fact sheet did not differentiate viewbooks in this study, there are viewbooks currently in use which do not include such summaries.

Discussion

As competition among colleges for fewer students stiffens, many people in higher education are advocating the application of marketing principles (e.g., identification of market segments, targeting different messages to different segments, identifying one's market position relative to competitors) to the college Admissions process. This study advocates the use of a recognized marketing tool, qualitative research, by more colleges on more frequent occasions. This study is not suggesting the substitution of qualitative research for quantitative (there will always be occasions to use each type), but rather the addition of qualitative research to the Admissions research repertoire.

The findings from the current study contributed greatly to the creation of a viewbook for the researcher's institution. One example of the many changes made on the basis of the findings was to the cover of the viewbook. An all-text monochrome cover was replaced with a color photograph of the campus in the new viewbook.

While the quantitative results of this and many other changes to the viewbook will not be known for some time, one improvement over previous years is that plans to monitor the success of the viewbook are in place. It was collectively decided which one office (Admissions or Institutional Research) would be responsible for conducting such research, and a schedule for collecting information was determined.

An additional benefit which resulted from this study was that writing the content of the viewbook afforded an opportunity (other than an impending re-accreditation visit) for many members of the administration to step back and take stock of the institution. Writing this viewbook forced top administrators, Admissions Officers, and Institutional Researchers to review **together** the institution's mission statement and to take a critical look at the progress the institution had made in many areas (e.g., diversity of students and faculty, student outcomes) since the last revision of the viewbook.

In addition, the Admissions and Institutional Research personnel at this institution developed a closer working relationship through this project. A procedure and schedule for reviewing all Admissions literature has been regularized. The Institutional Research personnel now sit on a committee to review all Admissions literature including the course catalogs, posters, applications, form letters, and post cards. The next steps for this institution are to assess (both qualitatively and quantitatively) the success of the new viewbook.

Earlier, this paper reviewed literature predicting increased pressures upon Admissions Officers to assess the effectiveness of recruitment strategies which this author believes will result in an even greater level of involvement of Institutional Researchers in Admissions-related research. This paper also discussed the crucial role of printed Admissions literature and reviewed the opinions of experts who predict an expanded role of printed literature in the near future. The lack of generally accepted guidelines describing what differentiates an effective publication from an ineffective one, the individuality of colleges leading to the uniqueness of their literature, the possible differences in preferences among different segments of students, and the change in students' preferences for such literature over time, all contribute to the need for Institutional Researchers at successful colleges to conduct their own research into what strategies work and which do not work for their particular institutions and segments of the student population.

An increased awareness among researchers of the benefits and limitations of qualitative research will allow researchers to discover for themselves what is successful and what is not for their institutions. It will also allow researchers to more effectively choose a consultant to conduct qualitative research (if necessary) and to interpret that consultant's findings more meaningfully. This study offers one method for evaluating the effectiveness of various strategies within the medium of printed recruitment material. It also shares students' general preferences for certain strategies over others.

This study has explored the use of qualitative research in one very specific project--the audience testing of Admissions publications. Qualitative research methods are currently being applied to many other areas of higher education such as the Admissions process in general, retention, development, and faculty performance appraisals. As the many benefits of qualitative research in become more widely known and its applications to other areas of research in higher education increase, it is incumbent upon all institutional researchers to be familiar with strengths and limitations of the technique.

## Table 1--Student Preferences for Covers and Contents of Admissions Literature

### A. Covers

| Attribute | Preferred | Not Preferred |
|---|---|---|
| Heft | Presence | Absence |
| Amount of Photographs (as a proportion of cover) | Large | Small |
| Content of Photographs | Outdoor<br>Activity<br>Unstaged candids<br>Students<br>Campus | Indoor<br>Passivity<br>Staged, posed<br>Models<br>Close-ups of people |
| Colors | Natural (greens, browns) | Unnatural (purple, teal) |
| Finish | Matte | Glossy |
| Tone | Quiet, peaceful | Loud |
| Amount of Text (other than name of college) | Little or none (a phrase) | Large (sentences, paragraphs) |
| Size | 8 and 1/2" by 11" | Other than 8 and 1/2" by 11", larger or smaller |
| Orientation | Vertical | Non-Vertical, square, horizontal |
| Simplicity | Presence | Absence |

### B. Contents

| | | |
|---|---|---|
| Organization | Question and Answer | Headings |
| Ratio of Text to Photographs | Balanced, close to 50:50 | Unbalanced, in either direction, too much text or too many photographs |
| Length | Moderate (13-32 pgs) | Very short (less than 14 pgs) |
| Point of View (subjective vs. objective) | Balanced | Unbalanced, in either direction |
| Size of Print/Typeface/Font | Large | Small |
| Fact Sheet | Presence | Absence |

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# A FRAMEWORK FOR SYSTEMATIC BUDGET ANALYSIS

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Faced with diminishing revenues, soaring costs, and increased calls for accountability, institutions of higher education across the country are forced to examine their budgets and expenditures with unprecedented rigor. Review and evaluation must be systematic and comprehensive so that institutional management might assure itself that all expenditures are at appropriate levels.

But how does an institution's management determine what "appropriate levels" are, especially when the institution is seriously underfunded? In order to evaluate a budget and identify expenditures that are too high or too low, managers must be able to compare them against something else. In other words, they must have one or more frames of reference as bases for comparison.

## Some Personal History

The frame-of-reference approach to budget analysis evolved while I was working simultaneously on two projects: preparing to teach a graduate course in classroom testing and planning a "comprehensive" analysis of the university's budget.

The university's budget was to be analyzed to determine whether the university's expenditures were at appropriate levels. Perhaps the best available tool for budget analysis is NACUBO's workbook on financial self-assessment (Dickmeyer & Hughes, 1987). While the workbook examines an institution's finances from a wide variety of perspectives, it deals more with the institution's resources and its overall fiscal health of an institution than where it allocates its resources. Furthermore, the information can be overwhelming in volume; a framework within which to organize it is needed.

While I was contemplating these issues, I was preparing for my course on classroom testing, including reviewing my lecture notes on grading and evaluation. In them, I stress that a test score alone is meaningless. Suppose, for example, that a student has scored a 65 on a test. This information alone tells us nothing about how well the student did. We need to compare the 65 against something else in order to interpret it properly.

- Suppose we are told that the mean score for the class was 60. Now we know the student did relatively well--above average. This type of evaluation--comparing an individual against a peer group--is called **norm-referenced** evaluation.

- Suppose we are told that this test is graded as follows: 90-100 is an A, 80-89 is a B, 70-79 is a C, and 60-69 is a D. In this case we can

conclude that the student did relatively poorly, barely passing. This type of evaluation--comparing an individual's score against prespecified standards--is called **criterion-referenced** evaluation.

- Suppose we are told that the student earned a 35 on a similar test a year ago. Obviously the student has shown great improvement. This type of evaluation examines **change** or growth over time.

- Suppose we know from aptitude testing or from previous classwork that the student has the potential to earn a very high score on this test. Assuming the highest possible score on the test is 100, this information implies that the student did not do very well. This type of evaluation is more **qualitative**; it compares the student against less rigorous standards, even gut instincts.

These approaches to grading are discussed in many textbooks on educational testing and measurement (for example, Gronlund, 1985, p. 448, and Stanley & Hopkins, 1972, pp. 309-310). It is generally agreed upon that the most effective evaluation examines multiple measures from as many different frames of reference as possible.

Why not evaluate a budget using the same approach? An evaluation of a budget can include the same four frames of reference that are used to evaluate academic performance: change, norm-referenced, criterion-referenced, and qualitative.

**The Change Frame of Reference**

In this frame of reference, the institution's current budget is compared with those of previous years. Discussion focuses on why major increases have occurred in certain areas and whether those increases match University priorities. For example, an institution might examine several years' worth of department credit hour production and student/faculty ratios for trends.

**The Norm-Referenced Frame of Reference**

In this frame of reference, expenditures are compared against a "norm group" of other programs or institutions. Discussion focuses on why the expenditures are unusually high in some areas and whether those discrepancies are appropriate given institutional priorities. Examples of norm-referenced analyses include:

- Comparing institutional expenditures against those of peer institutions.

- Comparing staffing patterns against those at peer institutions.

- Comparing summer session productivity (credit hour production, student/faculty ratios) against fall and spring productivity.

- Comparing department productivity (credit hour production, student/faculty ratios) against other departments at the institution with similar missions and against institutional averages.

- o Comparing department productivity (credit hour production, student/faculty ratios) against those of similar departments at peer institutions.

**The Criterion-Referenced Frame of Reference**

In this frame of reference, expenditures are compared against an arbitrary "criterion" or standard. Examples of criterion-referenced analyses include recognition that:

- o Personnel expenditures should be no more than a certain percentage of total expenditures.
- o The institution's overall student/faculty ratio should not be much more than a certain figure.
- o Some program expenditures should not exceed income generated.
- o Some program expenditures should not exceed their original budgets.

Much of the "ratio analysis" suggested by NACUBO and by Kent Chabotar (1988) fall into this category. Chabotar suggests, for example, that 12-15% of an institution's budget should be spend on administration as opposed to direct program services.

**The Qualitative Frame of Reference**

In this frame of reference more subjective appraisals of expenditures are made. The most important basis for comparison is the institution's mission and strategic directions, and operational plans. Meisinger (1989-90) argues, "The setting of budget priorities needs to be informed by plans. . .A budget established without the aid of program plans is. . .ill-informed. . ." Institutions that plan (and who doesn't these days?) must determine whether they are spending money in accordance with established institutional priorities.

This is also the place to bring in "gut instincts." Based on a subjective, holistic analysis of institutional experiences, what expenditures <u>seem</u> appropriate or excessive?

**Using the Frames of Reference**

Sound, comprehensive evaluation requires a variety of evaluation techniques. Because each piece of budget information has inherent limitations and insufficiencies, no decision should be made on the basis of one piece of information. Decisions should instead be based on a broad range of information.

Using multiple frames of reference with several types of information within each framework helps ensure that an institution's budget and expenditures have been analyzed from a wide variety of angles and that a balanced perspective has been employed.

**Summary**

Four frames of reference (change, norm-referenced, criterion-referenced, and change) have been proposed for analyzing whether institutional expenditures are at appropriate levels. Using a variety of data under several frames of references ensures a balanced perspective in this sensitive undertaking.

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# Forecasting Enrollment in a Period of Institutional Transition

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Institutions of higher education, like organizations of other industries, are faced with a continually changing environment that requires adaptation to ensure survival. Over the last decade, colleges and universities have faced declining traditional-aged student populations as well as other demographic shifts within the external environment. Such shifts have led to warnings of a fundamental transformation which threatens to have a profound impact on higher education (Cameron & Ulrich, 1986). This paper describes an enrollment forecasting model developed in 1988 by the Office of Institutional Research for a small, private, liberal arts college that is undergoing an institutional transition from its historical junior college mission to a comprehensive baccalaureate institution to adapt to changing demographics. The model takes into account the transition of student enrollment from largely associate and transfer degree programs in the past to the new baccalaureate degree programs of the present. The model is aiding the college in various aspects of decision making, including budgeting as well as strategic planning.

The concept of organizational adaptation, especially as it relates to strategic choice and strategic planning, has recently been introduced to the higher education community (Nordvall, 1982; Cameron, 1984; Chaffee, 1985; Cope, 1987). Organizational adaptation refers "to modifications and alterations in the organization or its components in order to adjust to changes in the external environment." (Cameron, 1984, p. 123) Views of organizational adaptation vary in the literature. With "natural selection", the external environment, not management, controls adaptation. With "strategic choice", the actions of managers, not the environment, are seen as the important causes of organizational adaptation (Hall, 1972). The interactions and interdependence between strategic choice and the environment have also been used to define organizational adaptation (Hrebiniak & Joyce, 1985).

Events and methods of organizational adaptation tend to be organization specific; that is, what works for one organization may not work for others (Chaffee, 1984). One method of adaptive response to the environment in higher education involves the broadening of institutional mission or program offerings. Over the period from 1948 to 1968, eighty-nine two-year colleges transitioned to four-year institutions, a process which has been seen with increasing frequency (Hodgkinson, 1971). In a study of the adaptation responses of two sets of colleges, Chaffee (1984) noted that "the frequent assumption is that changing academic programs and attending to recruitment are the primary levers for improving the condition of the college. The fact that nearly all of the colleges in this study increased the number of academic programs they offered and made structural changes in order to attract students suggests that colleges often use those levers." (p. 232)

Lewin's model of change describes the process of organizational change in three phases: (1) unfreezing the existing structure, or creating a disruption of equilibrium, (2) moving the institution to its new state, and (3) refreezing the organization, or establishing a new equilibrium (Hanson, 1985; Jackson, Morgan, & Paolillo, 1986). The institution in the current study exemplifies the change processes involved in the organizational adaptation to shifts in the external environment.

Historically a junior college offering associate and transfer-degree programs, the institution faced the environmental impact of declining student enrollment and impending financial difficulty. In 1983, a new president responded to these problems by aggressively initiating a transformation of the institution from its junior college roots to a comprehensive, baccalaureate institution. Commitment to the new institutional classification can be seen around the campus. Over the past seven years, the number of baccalaureate-degree programs increased from six to twenty-two while the number of associate-degree programs steadily declined. Faculty hiring standards have been raised to emphasize the requirement of a doctoral degree, typically required for comprehensive institutions. The institution's fundamental change in structure is reflected in the composition of the student body as well. The percentage of students admitted in the Fall, 1986, class who declared a baccalaureate-degree major was slightly less than 30 percent. This percentage increased annually to over 65 percent for the Fall, 1989, entering class. Full-time student enrollment increased each year from the onset of the transition, achieving its highest level in the over 100-year history of the college in the Fall, 1989 semester.

Allocation of institutional resources is problematic during the transitional phase of the change process. Resources must be allocated in part to maintaining the status quo while, at the same time, a level of resource allocation is

required to "fuel" organizational change, thereby altering the allocation of resources within the institution (Kaufman, 1971). Budgeting for this college is based largely on the projected size of the full-time student body, since tuition and fees represent the vast majority of institutional revenues. Forecasting enrollment, while never an exact science, is especially difficult during this period of transition as admission and retention rates are also adjusting. Because of the small size of the college and the sensitivity to enrollment shortfalls, budgeting had been based on unrealistically low enrollment estimates, which limited the administration's ability to develop a comprehensive budget or adequately plan for the future.

## FORECASTING ENROLLMENT

A review of literature yielded several enrollment forecasting models which focus on compositional factors of the student body (Weiler, 1980; Chatman, 1986; Yost and Chino, 1986; McFaul, Wilders, Loscheider, & Luze, 1988; Dickey, Asher, & Tweddale, 1989). None of the models, however, were applicable to the shifting demographics of the institution in transition. In 1988, an enrollment forecasting model was developed by the Office of Institutional Research and Planning which is sensitive to the college transition.

The projected enrollments are based in part on the current retention of students in baccalaureate (BACC) and non-baccalaureate (NBACC) programs. The NBACC programs include the remaining associate and transfer degree programs as well as those student admitted who are undecided. Inasmuch as the institution has only recently created several BACC programs, the retention data was collected for each semester beginning with the Fall, 1984 entering class.

The students who enter the institution as full-time are longitudinally tracked with their entering class over the successive semesters. All students entering in the Fall, 1984, semester, for example, have been combined and tracked from the Spring, 1985, semester to the present. For each of the semesters from Fall, 1984, to the present, the full-time enrollment from each class has been separated into BACC and NBACC majors, thereby producing retention statistics for each class by semester.

In the initial model, actual enrollment numbers were used for the Fall, 1984 to the Spring, 1988 semesters, which provided the initial data for the projection of returning students. The average retention (geometric mean) for each semester for BACC and NBACC students is used in projecting the contribution each class will make to the full-time student enrollment over the projected period. In February of each

year, the model is updated to include the retention data for the latest fall and spring semesters.

Table 1 shows the average retention of full-time students by term (fall or spring) and degree type (BACC versus NBACC) of admittance. Retention into the second semester of the students entering in a BACC program is 91 percent, which is over 10 percent higher than their NBACC counterparts. By the sophomore year (third semester) for those students entering in a fall semester, almost 7 of every 10 students seeking a baccalaureate degree are retained, as compared to approximately 5 of every 10 students seeking an associate degree.

Table 1
Retention Percentages by Term and Degree Program of Admittance

| | FALL Admittance | | SPRING Admittance | |
|---|---|---|---|---|
| Semester | BACC | NBACC | BACC | NBACC |
| Second | 91.1% | 80.8% | 54.2% | 40.0% |
| Third | 68.9 | 51.5 | 41.7 | 34.3 |
| Fourth | 64.7 | 44.1 | 29.5 | 16.3 |
| Fifth | 49.8 | 15.6 | 31.2 | 12.4 |
| Sixth | 46.6 | 12.1 | 0.0 | 0.0 |
| Seventh | 44.8 | 6.8 | | |
| Eighth | 44.9 | 6.3 | | |
| Ninth | 32.1 | 2.5 | | |
| Tenth | 12.5 | 2.5 | | |

BACC: Students enrolled in a baccalaureate degree program.
NBACC: Students enrolled in a non-baccalaureate degree program.

In projecting the composition of the incoming classes for the years forecasted, two assumptions are required. The first assumption is the number of students for each future entering class who will select a BACC program versus a NBACC program. The percentage of students entering in a BACC program has increased from 22 percent of the Fall, 1984 entering class to 65 percent of the students entering in the Fall, 1989 class. This percentage, for projection purposes, is modestly increased by 2 percent for each Fall term over the previous Fall term for the years forecasted. The Spring semester entering classes, which are quite small, are held constant based on past entering classes at 60 percent.

The second assumption is the size of each freshman class for the Fall and Spring semesters for the forecasted period. Because new student admission has fluctuated widely over the past five years (a range of 100 students), three scenarios are projected and labelled best case (400), average case (350), and worst case (300). The size of the entering Spring classes is held constant at 20 students, based on the stable student yield for the past Spring terms.

Table 2
Enrollment Projection Error
1988-89 and 1989-90 Academic Years

| Semester | Projection | Actual | Error |
|---|---|---|---|
| Fall, 1988 | 804 | 825 | -2.5% |
| Spring, 1989 | 743 | 719 | +3.4% |
| Fall, 1989 | 867 | 875 | -0.9% |
| Spring, 1990 | 779 | 775 | +0.5% |

The model was used to project the 1988-89 and 1989-90 academic year enrollment. The projections, actual enrollment, and percentage of error are shown in Table 2. The model experienced a +0.3 percent error in the 1988-89 year, and a -0.4 percent error in the 1989-90 academic year. The margin of error per semester was less than 4 percent in the first year and less than 1 percent in the second year of usage.

## USING THE MODEL

The forecasting model is aiding the college in a variety of ways, but mostly in budgeting and strategic planning. For purposes of budgeting, the forecast model provides the budget with a forecasted enrollment as well as enrollment by entering year. In 1985, the college adopted a tuition freeze program which guaranteed students a fixed cost of tuition for eight consecutive semesters. The tuition freeze policy was eliminated in 1989, but the effects of the policy continue until all entering classes admitted through 1989 experience eight consecutive semesters. The enrollment forecasting model provides the budget committee with estimates of how many students enrolled in the projected period will be eligible for the tuition freeze.

In strategic planning, the model has been extremely helpful. The model facilitated the planning committee in answering questions such as how large will the entering freshman class need to be in order to achieve a full-time enrollment goal in three, four, or five years. Because the model separates BACC from NBACC programs, the committee can anticipate changes in the retention rate of the institution as more and more students enter the institution enrolled in a BACC program. By changing the size of the freshman class and viewing a best versus worst case scenario, the planning committee can also reasonably anticipate the future growth of the student body. Finally, in linking planning to budgeting, the enrollment model has provided the five-year enrollment estimates which drive the financial forecasting model.

## CONCLUSION

The enrollment forecasting model has been an aid to the administration in several ways, most especially in the areas of budgeting and strategic planning. The model was developed in response to changes resulting from organizational adaptation to shifting demographics. As the institution advances closer to the final stages of transition and establishes itself as a baccalaureate institution, the enrollment forecasting model will be modified. In the current flux, the model provides reliable enrollment estimates that are predicated on the transitional composition of the student body from predominantly NBACC to BACC. Institutional research will continue to serve an important role in aiding the college planning and budgeting efforts by maintaining an enrollment forecasting model which is sensitive to the institutional transition.

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# CREATING A SENSE OF NEED FOR AN INSTITUTIONAL RESEARCH OFFICE

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## Abstract

Timely and relevant research studies can provide a springboard for the establishment of an institutional research office. This paper discusses, in broad terms, the process by which an institutional research office can evolve from research which effectively meets a college's information needs and which provides guidelines for important school policies. It concludes with a description of how a voluntary association of institutions can support an emerging IR effort in one or more members of the association.

## Admissions research

Appropriately for a small, tuition-driven institution, the notion that institutional research could be useful at Franklin Pierce College (1989 fall enrollment: 1300) initially grew from a marketing research study. In 1982, all freshmen were surveyed at fall orientation regarding their attitudes toward Franklin Pierce prior to matriculation (see attachment 1). This study was conducted on the initiative of a staff member of the admissions office who had had previous experience in market research. It reached the conclusion that the promotional strategy was correctly targeted. That is, students were attending Franklin Pierce College for the reasons that were emphasized in the promotional literature and in personal contacts with prospective students. These reasons centered around the personal quality of the teaching and the location of the campus.

This study was repeated for four years, each time reinforcing and providing additional insights into the promotional strategy of the College. The soundness of the survey findings has been reflected in the 32% increase in fall enrollment since 1983. Franklin Pierce has continued to grow, going against the grain of the substantial decline in the numbers of high school seniors on the northeastern United States.

## Reaccreditation

The second event that helped create a sense of need for institutional research at Franklin Pierce was the College's reaccreditation review by the New England Association of Schools and Colleges in 1988. When the committee that was to write the required self-study report began to plan its work, it became clear that the more evidence that could be presented to support various claims, the more valid the report would be. However, the committee members were surprised at how little evidence for program effectiveness could be found. There were bits of data in various departments, but most of it was not obtainable in systematic ways. Furthermore, there was little coordination between academic departments.

Thus, the self-study committee soon recommended that the College begin an ongoing, systematic process of regular data collection. Several studies were done for the self-study report, such as an analysis of grade distributions by academic department and a survey of alumni vocations.

The self-study report itself also recommended research in a number of additional areas, such as program evaluation and alumni followup. Since accrediting bodies and state legislatures are increasingly calling for accountability in higher education, the trend toward requiring ongoing assessment in accreditation reviews will undoubtedly continue. That alone may provide the rationale for the creation of an institutional research office. However, information must also be desired by decision-makers in order for the research to be used effectively.

After the reaccreditation review was completed, the faculty member who had coordinated the self-study process was assigned to work in institutional research. Thus, the team of an admissions staff person and a faculty member was created, with the expectation that this combination would give breadth to the research effort.

## Retention research

The usefulness of the freshman attitudes survey and the national decline in the numbers of high school seniors has led more recently to a focus on retention studies -- the other side of enrollment management from admissions -- and has supported the establishment of the institutional research team. In this case, the initial retention study (a description of retention trends by class, e.g. freshman to sophomore retention) has led to surveys and in-depth focus group interviews on the reasons for withdrawal of matriculated students (see Madden and Weir, "A Comparison of Exit and Retrospective Surveys", also presented at this conference). In addition, withdrawal of deposited students is being studied through mail and telephone surveys.

Retention is a more complicated subject than recruitment, involving academic affairs, student life, athletics, and facilities, as well as recruitment factors. However, retention

research appears to have played a part in a 14% increase in freshman-sophomore retention between 1987 and 1989. The distribution of retention data, as well as the increased awareness that every department plays a part in retention, has probably had an important effect by itself. As a result, there has been increased support for retention research, currently our main focus. (See attached summary of research conducted.)

The compilation of enrollment statistics has kept pace with the investigation of attitudes. A general computer file, including high school and Franklin Pierce data, is maintained on each fall and January entering class. Enrollment data and retention statistics are updated on a semester basis.

The compilation of retention data has contributed, in turn, to the development of a model for forecasting fall and spring enrollment. Using retention rates tied to student cohorts defined by matriculation dates, this model has been able to accurately predict September and January enrollments for the past two years. For a tuition-driven school undertaking substantial physical plant expansion, these accurate enrollment predictions have been of great value.

It can thus be seen that the growth of the institutional research "office" at Franklin Pierce has resulted from the spontaneous initiation of admissions research and the demands of accrediting agencies. When the results of this research proved reliable and useful, the demand for retention research was made. Effective retention research has been associated with the development of an enrollment forecasting model. Thus, useful research has tended to raise new questions from decision makers, which has in turn led to the demand for additional research. Independent initiative, timeliness and relevant information have all contributed to the growth of institutional research at Franklin Pierce.

## An external source of support

Franklin Pierce College is a member of the New Hampshire College and University Council (NHCUC), a non-profit voluntary association of accredited public and private bachelor's degree-granting institutions in the state. Of the Council's thirteen institutions, only two have an office containing the term "Institutional Research" in its designation. However, the demand for information on which to base rational management decisions is present in all of the institutions.

In fulfilling its mission of advancement of higher education in New Hampshire, the council (among other things) supports professional development activities for the personnel of its member institutions, and promotes the resource sharing and collaboration in programs of mutual interest. Many activities of this kind are carried out through "committees" representing various disciplines and specialties within the colleges. For example, there are committees of library directors, admissions officers, career planning/placement directors, purchasing officials, computing managers, academic deans, administrative vice-presidents, and security directors.

The newest committee is the "NHCUC Policy Analysis/Institutional Research Committee." The PA/IR Committee has as one purpose the improvement of such management information, and it encourages all institutions to send representatives to its meetings so that the mutual assistance and collaborative effort that have characterized NHCUC activities for all of its twenty-plus years of existence can come into play in the IR area as well. As mentioned above, NHCUC is a purely voluntary association of colleges; consequently it has no regulatory "clout" over any member. However, in supporting the development of the institutional research capability among its members, NHCUC has done these things:

1. **Provided organization and staff support for the committee.** Even in situations where a number of institutions are ready to "do" institutional research, there is no mechanism to bring interested representatives together. NHCUC can "call a meeting" and provide a rationale for the member institutions to authorize staff travel, etc. In addition, NHCUC staff help set up meeting facilities, mail out notices and other documents of interest, record and distribute minutes of the meetings, and perform other administrative tasks.

2. **Provided professional development opportunities.** NHCUC has limited funds with which to provide seminars, workshops, and consultant services. For example, NHCUC can employ a speaker to discuss some topic of mutual interest at a scheduled regular meeting, or at some special time.

3. **Encouraged (and arranged for) cooperation among committees with similar interests.** As an example, the Computer Managers' group and the PA/IR committee have overlapping interests where data retrieval and computer analysis are concerned. NHCUC can take a broader view of these interests, and assist in communication between institutional researchers and computing resource managers who might not otherwise talk to each other or who might not understand each others' jargon. (Remember that many of the institutions give IR responsibilities to faculty and staff personnel.)

4. **Prepared and distributed research reports of consortium-wide interest.** The development of IR information within state systems of higher education is routine. However, NHCUC is able to perform this function for the combination of public and independent institutions in New Hampshire. Committee members advise NHCUC of problems related to sensitive information, and deliberations take place with an understanding and acknowledgement of "turf" problems.

5. **Encouraged participation in regional and national professional organizations.** NHCUC encourages committee involvement in several professional organizations, and participates in those organizations within its limited resources.

The foregoing list is provided to stimulate thinking about how cooperation in institutional research can happen among unrelated colleges. It is easier for a formal association to do some of these things, but there are many ways in which informal collaborative activities can generate an awareness of the value of organized institutional research.

NHCUC has been cited as a model for cooperative involvement of institutions several times. Its relative success has come from encouraging institutions to get involved with each other in solving mutual problems while keeping itself in the background and operating as a facilitator and advocate for the institutions. After all, the action is in the institutions themselves; the consortium's role is to attempt to focus that action upon the common problems and find mutually acceptable and mutually satisfying solutions to those problems.

**Future challenges**

At this point, institutional research seems well positioned to become an established function at Franklin Pierce College. The institutional research team has shown that it can produce timely and relevant studies to help guide the College's enrollment policies and to meet accreditation requirements. The team participates regularly in the activities of the NHCUC PA/IR Committee, where questions about methodology and reporting can be raised, and where other institutions can learn of IR activities taking place on the Franklin Pierce campus.

The principal challenges for the future will be to make decision-makers more aware of the usefulness of institutional research to the planning and evaluation functions of college administration and to provide additional research services where needed.

# Why So Few Science Graduates?
# An Investigation of Enrollments in Undergraduate Science Programs

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## Introduction

There has for some time now been a climate where business, industry and research have wrung there hands and wondered from where they will draw the next generation of scientists. Institutions, asked why there is this lack of new scientists "in the pipeline", have had a distinct tendency either to point downward in the educational structure, or to proclaim that it is a national problem, and somehow absolve themselves from responsibility. Fortunately the finger pointing is wearing a little thin, and with the incentive of increased grant money, institutions are looking at the state of their own houses and considering what they might do to increase the number of science graduates at all levels.

On the one hand the prestigious science universities are still producing scientists, but are concerned about increasing percentages of non-resident aliens most of whom will take their skills out of the country. Institutions of the middle tier, and indeed some of the very prestigious schools, are finding that although there are science applicants at the baccalaureate level, and there is no sign of increased attrition, there are fewer science graduates. Some of these institutions believe, and are beginning to assemble hard evidence to support this belief, that students starting their careers in science are switching to other majors which they find either easier or more interesting. They do not however yet know what to do to lure them back. Among institutions which have traditionally drawn from the population of the inner city or the poorer rural high schools, where students are the first in their family to enter higher education, science graduates are becoming rare indeed. The University of Massachusetts at Boston, as one of the latter schools, is eager to know what can be done to remedy their declining number of science graduates.

## Background

The University of Massachusetts at Boston (UMB) is the urban campus of the state's land grant university. The campus has an enrollment of around 12,500, 80% of whom are undergraduates, and 100% commuters. The largest college is Arts and Sciences, accounting for 63% of matriculated undergraduates. The remainder enroll in business, nursing, a non-credit based college of Public and Community Service, and, until recently, education. Two thirds of these undergraduates enter as transfers, most coming from either the community college system, the University of Massachusetts at Amherst, or the numerous private institutions in the Boston area. Very few come from out of state. Enrollment at the undergraduate level has been kept approximately steady after a peak in 1987.

At the undergraduate level, the sciences consist of chemistry, physics, engineering physics, biology, biology-medical technology, mathematics and computer science. Psychology, geography and anthropology have sued at various times to be considered sciences, but I have stayed with a more traditional definition and omitted them. UMB offers masters degrees in physics, chemistry, biology and computer science, as well as a PhD in environmental sciences. While the existence of these graduate programs undoubtedly affects both the undergraduate curriculum, and the atmosphere in the science departments, the focus of this study is the sciences at the undergraduate level.

Clues to the extent of the problem at UMB have been noticed in both enrollment and completions. In 1989 UMB awarded 7 bachelor's degrees in chemistry and 6 in physics. In 1990 chemistry awards increased to 16 but physics dropped to 3. While biology enrollments and completions are much larger, both have been declining, as, after a period of growth, have those in computer science[1]. The focus of this paper is the isolation of possible causes of this apparently poor graduation performance.

**Literature**

One of the frustrations which face those attempting to look at the problem of graduating students in the sciences, is that there is virtually no literature on the subject. One finds articles on problems of encouraging and retaining women and minorities, and although this is a significant problem, if we have a general malaise, bringing under-represented groups into a system which is not working will be of little use. There are some clues to be gleaned from the work on women and minorities, but unfortunately they would be more useful in collecting original data than in using institutional information. Parental and teacher support have been found to be important for women entering the sciences for example (Fitzpatrick, and Silverman, 1989) and one may speculate that for students from less affluent backgrounds in a large urban area such as Boston, these variables may be important. Steckler and Leserman (1985) also found parental education to be important. Unfortunately investigating this type of issue is beyond the scope of this study. There is however some information which is a little more useful in guiding some of the analysis. Grandy (1990) presents evidence of a lack of interest in science on the part of qualified highschool students, and several authors theorize that teaching style, particularly as it fosters involvement, is important in retaining students who do show interest in and commitment to a science discipline (Tobias, 1990; Neumann, Finaly-Neuman and Reichel, 1990).

One of the sources of information available for this research was the previous work done on retention at UMB. Students who enter as transfers are different enough in their retention patterns from freshmen that they must be analyzed separately, and the same is true for Fall and Spring cohorts. Spring cohorts are small, particularly in the sciences, and have a significantly higher risk of withdrawal. They have been excluded from all cohort analysis

[1] The healthiest undergraduate 'science' appears to be the two year engineering program which is excluded from this analysis because it is a preparatory program which simply guarantees entrance to baccalaureate programs external to UMB and offers no award. It is impossible to distinguish completers of the program from drop-outs.

used to study survival and graduation rates. Several factors contribute to higher risk of non completion at UMB, including low GPA and low credit load.

**Methodology**

This investigation was intended as a first look at the sciences, with the hope that some useful information and some guidance as to further areas of study would emerge. The study was based on existing data, particularly the institutional databases. The major problem facing the institutional researcher attempting the task of isolating causes in this type of project, is the lack of data organized in such a way as to facilitate the complex analysis which is needed. The analyst resorts to piecing together a picture from scraps, creating a three dimensional image from multiple two dimensional views. This study used two major sources of data. One of these is a longitudinal file created from the student record database, and containing all matriculated undergraduates attending between fall 1981 and fall 1989. While this is a rich source of information, and provides the ability to track retention and graduation, it has some drawbacks for the current study. The most significant of these is that only the most recent major is recorded, and hence there is no information on major switching behavior, or on those who started their career undecided as to choice of major. The Institutional Research Office also maintains census files used for all reporting. These may be matched across semesters and will trace changes of major. Of course this task is extremely tedious and time consuming, files exist only for 1985-1989, students change their IDs, there is no graduation information on the files, and rules for reporting change often enough to cause problems across years. I have decided that at this stage it is fair to make the assumption that these problems are evenly distributed across disciplines, and have used the files to look at major switching behavior.

In addition to the shortcomings of the data files for the purpose, there has been no enforcement of choice of major. Nothing is tied to that choice until a student is close to graduation. As a result the validity of the major which exists on a student's record is often uncertain. Again, the only solution is to assume that the problems are not related to particular disciplines, and to use the data with reservations. Yet a further frustration, and this one seems virtually universal, is that a student who drops out and one who transfers may be indistinguishable without resorting to special data collection efforts. As a commuter school with rather a loose registration and withdrawal system, UMB has a worse problem than most since there are no exit interviews, and we have no idea why a student leaves.

Given these problems in the data, I have coined the term "data archaeology" to describe the methods used. I have approached the study rather like an archaeologist uncovering the first layers of a dig. One records and labels everything until the picture begins to make sense. I have not rejected anything out of hand, but have included the "hard" evidence, such as completions recorded by the official university system, along with the stray opinions and observations of colleagues and students. It takes considerable restraint to accept that the blind men are examining the elephant, and to make the resulting picture as valid as possible.

**Findings**

The first question to be answered is whether or not a real problem exists in the institution. Table 1 shows the change in admissions statistics between 1985 and 1989. While there is some evidence that the sciences are falling behind in the college of Arts and Sciences (CAS) and the institution as a whole, nothing indicates a potential disaster.

TABLE 1
UMB Admissions

| Change from Fall 1985 to Fall 1989 | | | |
|---|---|---|---|
| | Total UMB | Total College | Sciences |
| Applications | 29% | 10.7% | 5% |
| Admitted Students | 13% | 3.3% | -4% |
| New Enrollees | - | -6.6% | -9% |

An examination of changes in enrollments and completions within the College of Arts and Sciences yields much more dramatic evidence of a discrepancy in the sciences.

TABLE 2
Enrollment of Declared Majors in the College of Arts & Sciences

| Change from 1985 to 1989 | | | |
|---|---|---|---|
| | Sciences | Arts & Humanities | Social Sciences |
| Enrolled | -8% | +37% | +51% |
| Graduated | -25% | +26% | +14% |

For whatever reasons, the sciences appear to be doing less well than expected at attracting new students, and relatively poorly at retaining and graduating them.

Grady(1990) reports that many students who have good skills for entering sciences are not doing so, but are choosing instead disciplines which they perceive as more lucrative. Tobias(1990) advances the theory that many students fail to enter the sciences not because they do not have the background or ability, but for more subtle reasons involving the way that science is taught at an institution. Looking at the verbal SAT scores of the students who entered as freshmen, it seems that there are a relatively large number who would be capable of a math or science education, but who choose not to major in those fields. Of CAS

students who entered as freshmen with math scores of 600 or above, 68% did not choose a science major. Although numbers vary by semester, as many as 20% of these top students are undecided as to major when they enter UMB, and yet most of these do not find their way into science. To find out whether transfer students show similar patterns would entail analysis at the course level which was beyond the scope of the current study, although it certainly provides ideas for further investigation.

Having seen an indication that many capable students are not entering science, is UMB losing science students internally to other disciplines? The answer to this is rather equivocal. To test the theory that students may be moving out of the sciences into other disciplines, all registered students with freshman status (30 credits or less) in the fall of 1985 were examined in fall 1989. A student who had either graduated or was still registered was counted a survivor. This method allowed both an accounting of where students from a major group went in the four years, and also a look at the origins of the students who made up these major groups in 1989. Figures 1 and 2 show the results of this comparison.

Figure 1

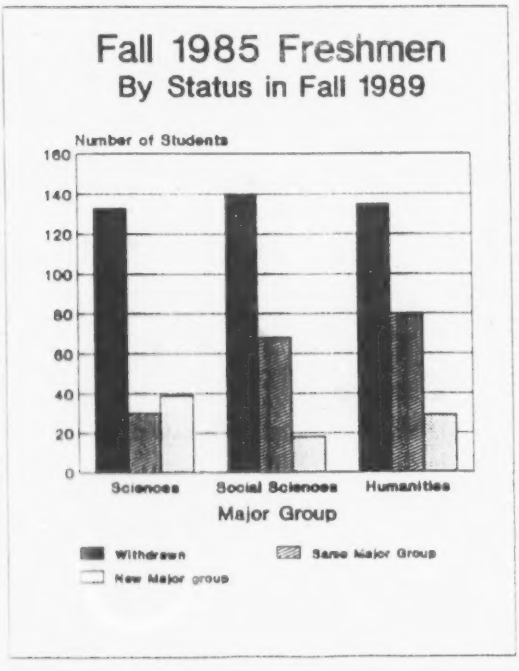
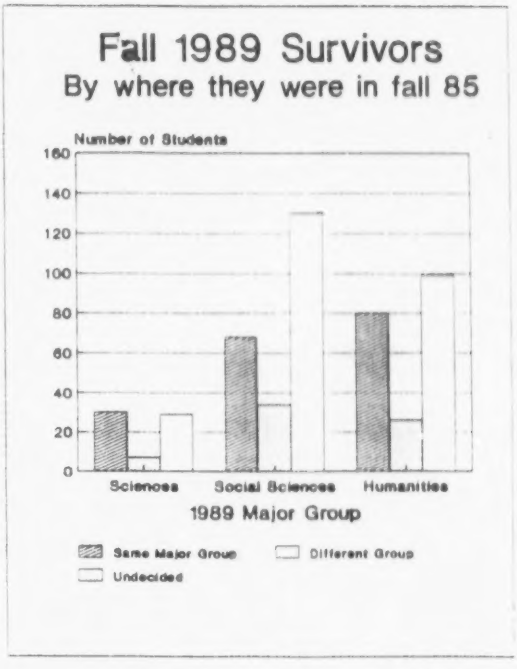



Figure 2




Of almost 200 science majors in fall 1985, only 30 are still in the sciences in 1989. A slightly larger group (39) have survived but are no longer science majors. In contrast, the social sciences and arts and humanities have retained a larger proportion of original majors. They have proportionately less switchers, but also less withdrawals than does the science group. This evidence seems to indicate that low science enrollments may indeed be due to switching behavior. When the fall 89 survivors are grouped by their 89 major however, we see that although the sciences lost 39 of their original majors to other disciplines, they gained

37 who switched in to science from elsewhere, an almost even balance. The other disciplines have gained many more students than they lost however, particularly from the pool of undecided majors, and have grown while science has not. Thus the relative losses in science appear not to be attributable to students switching out of science majors but rather to a combination of the lack of an influx from the undecided pool, and a high rate of withdrawal from the university.

If science students are not switching to other disciplines faster than they are switching into science, it seems clear that there must be a larger loss to the institution of science majors than of social science or arts and humanities majors. In order to look in more detail at students' patterns of leaving, the survival of fall cohorts from 1981 to 1986 were plotted by semesters since entry. The curves showing survival rates by discipline grouping (Fig. 3 & 4) support this. Science students are less likely to survive than are students in the arts and humanities or the social sciences, regardless of whether they enter as freshmen or transfers. In both cases the early semester show the greatest disparity. After the first two years, further attrition in the sciences is no greater than for other disciplines which may be an indication that it is those first few science courses which are crucial in a student's decision to continue.

Figure 3

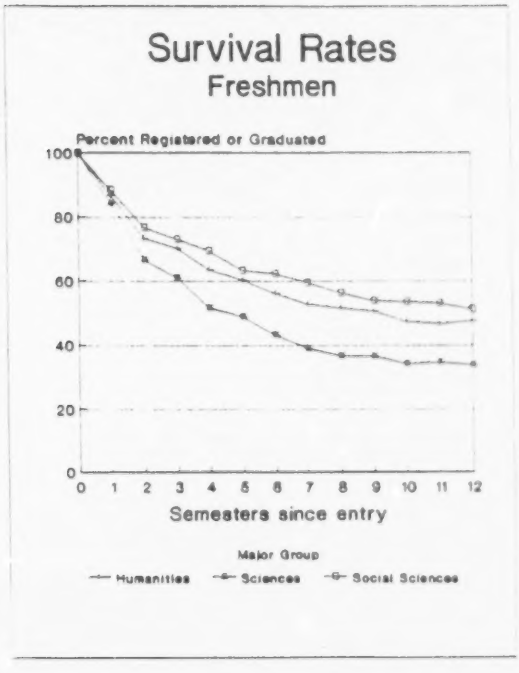
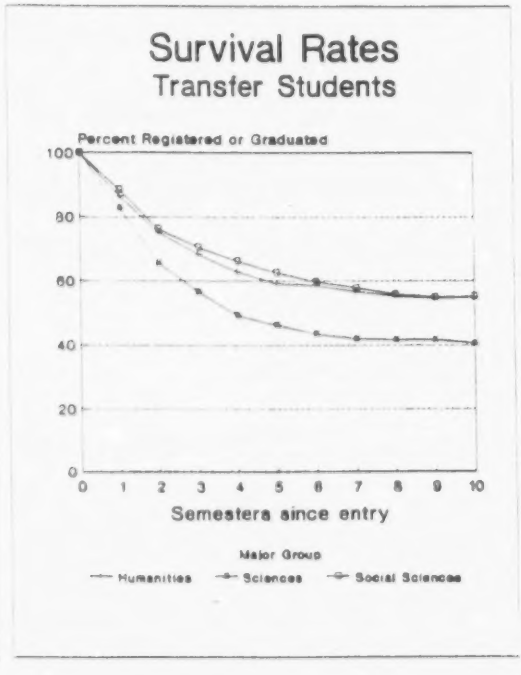



Figure 4




Graduation curves calculated in a similar manner, (Figures 5 & 6) reflect these findings. Arts and humanities and social science majors are more likely to graduate, and to do so sooner than science majors. Just over 20% of science freshmen graduate in 12 semesters and 35% if transfers in 10 semesters. By contrast the social sciences graduate almost twice as many of their freshmen majors in 12 semester, and 50% of their transfers in

10. Although the projection of these curves to further semesters is not as reliable due to fewer cohorts, all evidence points to the fact that they level off at these graduation rates.

Figure 5

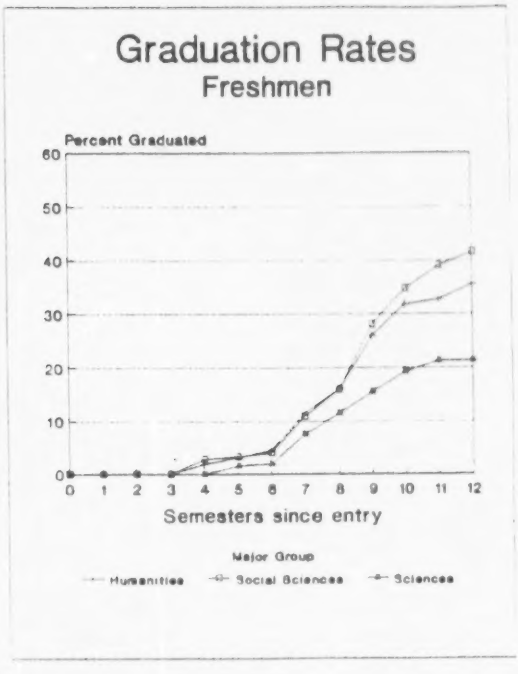
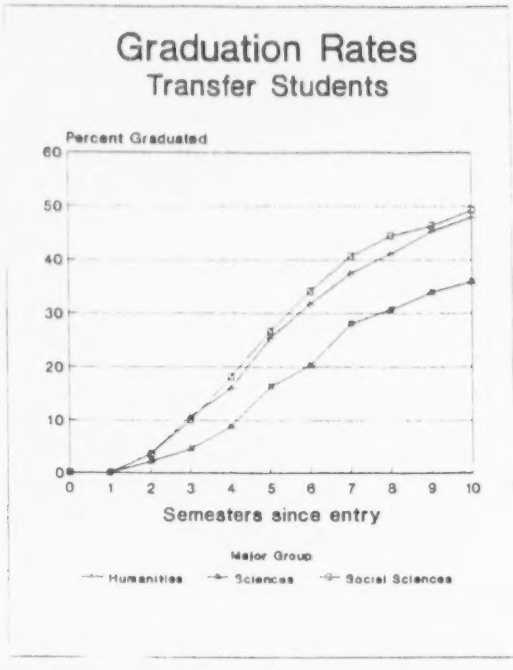
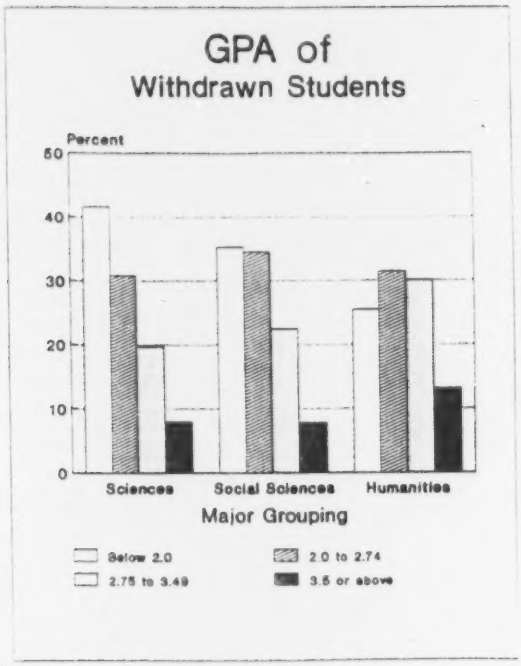



Figure 6




The conclusion seems to be that UMB loses its science students, not to the greater attractions of sociology or literature, but from the university itself. The question of course is one of why these students leave. One of the common explanations given by science faculty is that science is too difficult at the college level for many students, and those who cannot succeed drop out. The evidence on this is mixed. Figure 7 shows that over 40% of science students who leave do so with a GPA of 2.0 or lower, a sure sign of struggle. This is a greater proportion than those who withdraw as either social science or arts and humanities majors. On the other hand, it is worthy of note that almost 30% of withdrawn science majors have a GPA of 2.75 or higher, and 8% are in the elite category of 3.5 on more. If these latter students are indeed dropping out, it is not because they are finding science too hard. Anecdotal information offers two possible solutions. The first and most obvious is that students transfer to other institutions. There is currently an investigation of this for biology majors, but no data is yet available. The second, rather intriguing, suggestion is that good students in the sciences, especially in computer science, may obtain jobs before they graduate, and hence never complete their degrees. This would be exacerbated in a university such as UMB where most students are working, and the college is in an urban area with more employment opportunities.

Figure 7




## Conclusions

What emerges from this first excursion into the data is a mixed picture. Some advice is purely administrative, namely that until certain areas are functioning well, such as major choice, knowing what is happening will be very difficult. A vital piece of information for investigating or remedying the problems of the sciences is the student's major, and as stated earlier, major as recorded at UMB is of uncertain validity. Both admissions personnel and academic departments express the belief that the student's freshman major choice is not a 'real' choice. Until the institution has a better method to distinguish between true major choice and indecision, we can neither channel the students well for advising, nor be sure of our statistics. With a degree audit system in the first stages of implementation, and a newly implemented centralized advising system to work with students who have not yet chosen a major, we may, in the next few years, see an improvement in the certainty with which we can draw conclusions.

One answer which seems clear is that UMB's problem with graduating science students is at least partially attributable to attrition, as opposed to major switching. That more elite schools should see major switching, while state institutions are more likely to lose students entirely seems perfectly sensible given the barrier of entry to an elite institution. A student having obtained admission to Harvard, for example, is unlikely to consider leaving

if he or she finds science not to their liking. On the other hand, at a public institution, where admission is less difficult, it may be easier to drop out of school, at least for a while, and rethink one's career. The institution clearly needs a more comprehensive study of science students who do not graduate. Specifically we need to know why good students leave or transfer, especially as it may relate to teaching or the reputation of the institution. We also need to know why the science students with lower GPAs are not succeeding. At present we cannot separate poor preparation, about which something may perhaps be done, from low ability, which is irreparable. Answers to these two questions, although possibly radically different, may help the science departments to rethink their approach to teaching.

In addition it would seem that science departments are not taking advantage of the pool of undecided students. While this is a useful finding, we need to know whether this is due to the firm bias of incoming students against a science major, the fact that science departments are not introducing these students to science in such a way as to attract them, or do not see this 'selling' of their discipline as something appropriate to science faculty. One possibility would be to test Tobias theory by looking at 'ability' at entry as reflected by SAT scores and transfer grades, with evidence as to whether these students took any science courses at UMB. This would enable us to get an indication of the extent to which the problem is due to a lack of recruiting in the sciences, as opposed to a reaction to science instruction. A test of the theory that many good students do not enter science because of the structure of instruction, would be both interesting and provide vital information.

In conclusion, although the study appeared to provide more new questions than it answered old ones, it was worthwhile in that we are now at least aware of the questions.

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# ADVANTAGES OF INTER-INSTITUTIONAL COOPERATION

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The transfer of students from a community college to a baccalaureate institution has always been a priority for both the two-year and four-year colleges on Long Island. This geographic area has not been in the mainstream of studies depicting community colleges as having moved away from the transfer aspect of its mission, but, as proponents argue, the transfer function remains important to the vision of the institution (Alfred, 1990).

Much of the literature concerns policies and programs involved in transfer--all important. However, this paper is concerned with students before and after transfer. Transfer is, by definition, a two-way street, with the receiving institution the repository for the cumulative information. The two-year college is dependent upon information from the baccalaureate institution in order to determine persistence and academic success of its transferees. SUNY College at Old Westbury and Nassau Community College embarked on an institutional effort to merge and analyze data concerning students after transfer from the two-year to the four-year college. Nassau Community College is interested because transfer is one of its priorities and is a goal for the majority of students attending the college. Old Westbury's interest lies not only in planning for the future in a period of change in higher education, but for meeting the needs of a large segment of its student population.

> "Setting up a successful data-sharing project involves common sense guidelines: Be clear what you want, take advantage of what already exists, use appropriate technology, staff adequately, recognize that each institution is different, and concentrate on achieving insight rather than precision." (Dunn, Jr., 1987).

The College at Old Westbury is situated on the north shore of suburban Long Island in close proximity to New York City. Within commuting distance are three public two-year institutions with a combined enrollment of about 50,000 students. Nassau Community College is the closest two-year institution and provides the largest number of incoming transfers to Old Westbury each semester.

Transfer students have always comprised a large proportion of the entering class at Old Westbury. In the fall of 1973, transfers constituted 48% of the entering class and in the fall 1990, they comprised 66%. In the

spring semester, three-quarters of the entering students are generally transfers. This accounts for approximately 1,000 new transfer students each academic year.

When the first request for participation in a cooperative study on transfers was received in 1981 from Nassau Community College, questions regarding Old Westbury's transfer population were already being formulated by the administration. Since Nassau Community College is Old Westbury's largest feeder transfer institution, its transfers have the greatest impact on the institution. (See graph in Appendix A.) Today, in a climate of budget deficits and cutbacks as well as steep projected population declines for the region, it is even more imperative for Old Westbury to assess how it can best address the needs of its large transfer population. In addition, the State University Central Administration has targeted serving the graduates of the community colleges as a top priority and has asked the College to increase its admissions of these transfers. The Nassau Community College study, and the corresponding feedback, will continue to provide the College with information with which it can plan and make the necessary decisions.

## DATA COLLECTION

When Nassau developed its initial request for data, it appeared to be a simple request for student-specific information. (See file layout in Appendix B.) However, when it was examined in relation to the way data were stored at Old Westbury, several problems appeared. The first, and most serious problem was that Old Westbury did not maintain GPA's for its students. This was a policy decision stemming from Old Westbury's past, non-traditional history. The second problem had to do with the manner in which student information was maintained on the computer. At the time, individual administrative areas maintained separate non-integrated computer files of information. In addition, some information was not maintained on the computer at all but stored in students' folders in the Registrar's office. In particular, transfer credits and institutions were unavailable. Other information was requested in a different format, e.g. HEGIS codes rather than curriculum codes.

In order to comply with the request, computer programs were written to extract all the information available on the computer. A data file was created which was accessible with SPSS. Data conversions were made and a Report list was produced. Student transcripts were copied and unofficial GPA's calculated for comparative purposes only for this study. The information was then transmitted to Nassau Community College Office of Academic Program Study which then merged the Old Westbury data with Nassau data.

The next time the study was repeated, both the information requested and the file layout had changed. This, of course, required a subsequent change in computer programming and all the associated data transformations. Since Nassau had requested this information from several institutions, it also resulted in a request for standardization of the data request.

The possibility of designing a standardized file layout with which all the community colleges of SUNY could request information from the four-year institutions was addressed at several SUNY Association for Institutional Research & Planning Officers (AIRPO) annual meetings. In addition, the feasibility of having SUNY Central itself collect and report the transfer information as part of its data gathering effort was also explored.

Initially, these efforts were not fruitful, but within the last three years SUNY has designed a Transfer Feedback Information System. In the meantime, Nassau Community College has continued its study.

## INFORMATION RETURNED FROM NASSAU COMMUNITY COLLEGE

### 1984 Transfer Study

Nassau appended information from its own records onto the file supplied by the transfer institutions. The following is a list of the data elements which were appended: Area of Concentration; credits completed; graduation year; degree awarded (if any); GPA; high school decile; and session of attendance.

A report was generated using SAS and transmitted to the transfer institution. This report contained the following:

* A listing of Nassau Community College students who transferred to Old Westbury in the fall 1981 semester with more than 40 credits.

* Frequency tables of Nassau program department, baccalaureate major, and graduation status.

* Frequency tables of Nassau program department, baccalaureate major and graduation status by session of attendance.

* Table of means of GPA's and credits for Nassau transferees to all baccalaureate institutions and to Old Westbury.

* Table of means of high school decile, GPA's and credits for Nassau transferees to Old Westbury by baccalaureate major, Nassau program department and graduation status.

* A comparison of means of Nassau GPA with baccalaureate GPA for Nassau transferees at all baccalaureate institutions and Old Westbury.

* A comparison of means by graduation status of Nassau GPA with baccalaureate GPA for Nassau transferees at all baccalaureate institutions and Old Westbury.

* A comparison of means of Nassau and baccalaureate GPA's by baccalaureate major and Nassau program department for Nassau transferees to Old Westbury.

With this report, we were able to examine not only how students had performed at Nassau, but their subsequent performance at Old Westbury and compare that with transferees' overall performance at all the participating institutions. These comparisons were made based on graduation status and program of study.

1982 to 1989 Study

This study differed from the previous ones in that it collected data for transfers over eight years and did not limit the number of transfer credits. In addition, the report which was returned to each institution was changed. Performance, graduation rates, and mean GPA's were provided only for the transfers to Old Westbury; comparative data for other participating institutions was not provided. The following is a list of the information contained in the report:

* Pre-transfer academic status of Nassau transfers by graduation status. This included mean high school decile; average number of credits earned; and the average GPA.

* Post-transfer academic status of Nassau transfers to Old Westbury by Nassau graduation status. This included the average number of credits transferred; percent graduated; percent persisting; percent retention; and average Old Westbury GPA.

* The same pre and post transfer information broken down by major at Old Westbury.

Needless to say, this report has not as provided as much information as the previous ones. However, a data disk

was returned with the Nassau data appended and further analysis will be done at Old Westbury. (See sample tables in Appendix C.)

## OTHER TRANSFER INFORMATION

### SUNY Transfer Feedback System

This system was developed by the State University of New York Central Administration Office of Institutional Research. It tracks transfer students through their careers at the State University using already existing Student Data File and Automated Degree File systems.

While the feedback is primarily aimed at the community colleges, the reports generated provide the four-year institutions with information regarding program, persistence and graduation rates of all transfers. It is valuable for comparative purposes. Performance is a missing factor. Individual records show cumulative GPA's, but not the aggregated reports.

### LIRACHE Transfer Study

The Data Base Task Force of the Long Island Regional Advisory Commission on Higher Education, a regional higher education consortium, collects transfer data from the region. The report encompasses both private and public institutions. While the report provides only the number of transfers, combined with SUNY and State Education Department data, it provides a more comprehensive picture of where the graduates of the local two-year institutions continue their education. It also provides information on transfers out of an institution.

## USES OF TRANSFER INFORMATION

### Articulation

Under the umbrella of the State University of New York, graduates from the SUNY two-year institutions are guaranteed transfer into the four-year institutions. There are, of course, limitations based upon availability of program and academic performance. The information received from the Nassau study provides the opportunity to compare how transfers have performed academically at both Nassau Community College and at Old Westbury in the past. In addition, Nassau provides us with high school deciles of its transfers which are generally not available on our student data file for transfer students. We can determine whether transfers who have attained an Associate's degree are more successful than other transfers in persisting to the baccalaureate degree.

Old Westbury has also entered into several "two plus two" agreements whereby a student enrolling at a two-year institution is simultaneously guaranteed admission into a related academic program at Old Westbury upon completion of the academic requirements. While these programs have remained relatively small, the potential for growth exists and evaluation of the transfer students can provide valuable baseline information for the future.

Recruitment

As with other Arts & Science colleges, Old Westbury has experienced a growth in the demand for professional programs such as Business & Management, and Teacher Education at the expense of its liberal arts and science programs. In order to balance the academic mix of the institution, the College is moving towards recruitment and admission by program rather than to the institution. By examining the transferees previous program and subsequent program choice, recruitment can be targeted to those majors at Nassau who would most likely transfer into Old Westbury's liberal arts and science programs. Stronger ties and contacts between the institutions could also result from such individual targeting.

Enrollment Management

A number of issues were identified in the 1988 Enrollment Management Plan which pertained to transfer students. Among them was the fact that most transfer students do not apply for admission until well into the summer. Targeting recruitment and the development of stronger ties between faculty and institutions could encourage transfers to apply and register earlier.

Two other issues identified in the Enrollment Management Plan, better advisement and transcript evaluation, are closely related with articulation between institutions. As potential transfers are identified by their academic program at Nassau, course-by-course comparability will be developed and accepted. Subsequently, evaluation of transcripts can be done prior to registration instead of the current practice of later in the semester. Transfer applicants will know exactly what course of study they will need to obtain the baccalaureate degree and can plan accordingly.

Program Planning

With the implementation of targeted recruitment into academic majors, programs will be better able to plan their course offerings for future semesters. It will be known which courses upper-division transfers from a particular

two-year institution in a given academic program will have taken for an Associate's degree and which courses will be needed for completion of the baccalaureate degree. Course sequences as well as time of the day could be determined based on past enrollment patterns.

Assessment

Comparisons between the performance of native students and transfers can provide a valuable tool for assessing different populations' progress toward a degree. Questions about the success of developmental education on under-prepared students can be answered in light of their performance as juniors compared to incoming transfers at the same level. Here, in particular, the availability of transfers' high school deciles can prove useful. Other comparisons regarding Old Westbury's students and programs can also be made using the baseline information provided from the transfer study

## SUMMARY

The practical implications of a cooperative effort described in this paper can be numerous. It can provide both institutions with valuable tools for recruitment, articulation, planning and assessment. Hopefully, it will strengthen the ties between the institutions. However, in the long run it can most benefit the transfers themselves.

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# EXPERIENCES ASSOCIATED WITH THE GROWTH AND SATISFACTION REPORTED BY GRADUATING SENIORS

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**Abstract**

Building on previous research conducted at Albany by Patrick Terenzini, this investigation examines the educational outcomes reported by a representative group of 1990 seniors who entered the institution in Fall 1986. The project tests an improved set of items reflecting the scales of intellectual and personal growth developed earlier at Albany, and develops additional measures of academic and social integration.

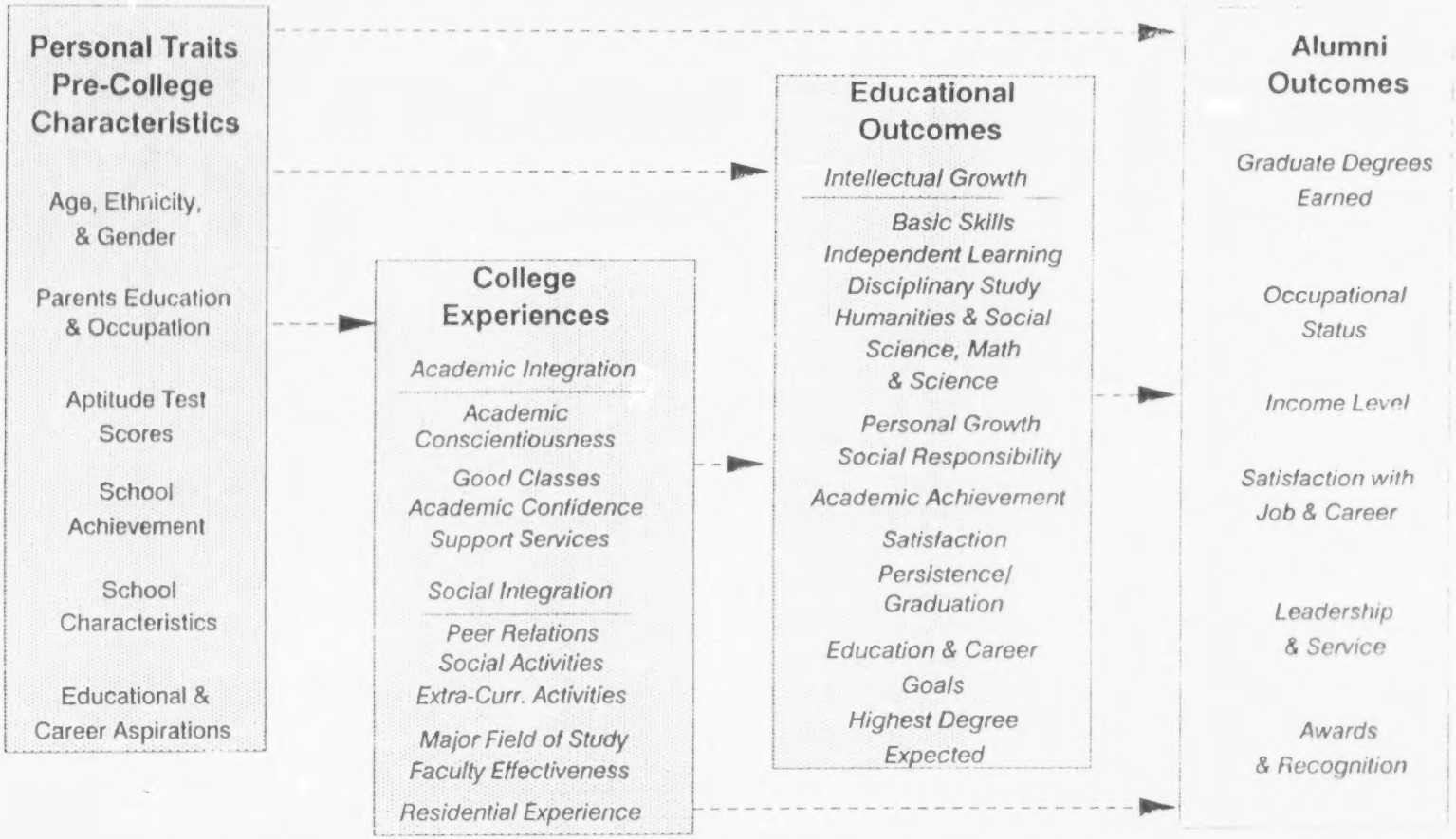
## INTRODUCTION

There are both educational and economic reasons for being interested in the intellectual growth and collegiate experiences of students. Increasing costs of higher education and growing competition for good students are placing campuses under pressure to document the educational benefits of programs and services they provide for students. Parents, trustees, state officials, and members of accreditation teams are only some of the individuals interested in assessing the results of the instructional enterprise.

There has been an enormous amount of research on college students in the past three decades. The extensive literature reviews by Bowen (1977), Feldman and Newcomb (1969), Lenning (1974) and Pace (1979) show that until recently most studies examined student academic performance, attrition/persistence, and personality development. Only a modest number of studies have addressed the development of intellectual skills during college.

Increasingly, faculty and staff at some campuses are beginning to view assessment as a vehicle to enhance the undergraduate experience. The SUNY Provost, with strong campus support has taken the position that we should undertake assessment, not to judge undergraduate education, but to improve it.

# Albany Outcomes Assessment Model



Pascarella, drawing on the work of Chickering, Spady, Tinto, and others, developed a conceptual model for research on student educational outcomes and their relationship to other college experiences (Pascarella, 1980). His longitudinal model postulates that student background characteristics (family background, aptitude, achievement, etc.) influence student educational outcomes, as well as the frequency and quality of student non-classroom interaction with faculty. Institutional factors (such as admissions standards, faculty culture, and organizational size) also have an influence on learning. In addition, the model suggest that informal contact with faculty and other college experiences interact with each other and that both have a reciprocal relationship with learning outcomes and student development. Several studies by Pascarella and Terenzini and their associates, using populations of undergraduates at different universities have supported the model (Pascarella and Terenzini, 1980 and 1982, and Terenzini, 1981 and 1882).

The attached figure shows the outcomes model developed at Albany over the years, based on the scholarship of Pascarella and Terenzini. The value of a model is that it guides both the formulation of research questions and subsequent measurement. This study set out to examine the amount of student growth which is associated with various pre-college characteristics and college experiences.

The model guided our investigation of the 1990 seniors who entered as freshmen in 1986. Building upon the previous outcomes research at Albany, we constructed survey instruments that reflect the concepts and variables in the model. One goal of the study was to improve upon the previous measures and to increase the amount of explained variance. In particular, we wanted to analyze the role of academic effort and student conscientiousness, as well as faculty effectiveness, in the growth reported by graduating seniors.

The following pages list the variables we employed, and the items in bold print indicate the items which were newly developed for this study.

PERSONAL TRAITS AND PRE-COLLEGE CHARACTERISTICS

1. Age, Ethnicity, and Gender

2. Parents Education and Occupation

3. Aptitude Test Scores

4. School Achievement such as high school average and rank in class.

5. School Characteristics such as size and location

6. **Educational and Career Aspirations and Values reflected on an entering student survey: We were especially interested in the effects of seven types of new student responses:**

   -- Graduate School Plans

   -- **Academic Diversity: These items reflect freshman interest in understanding other cultures, studying abroad, and valuing educational breadth and creativity.**

   -- **Social Concerns Scale: These items reflect the perceived Importance of Environmental, Political, and Community Service Activity**

   -- Inclinations toward Science

   -- An Ambitious Goals Scale

   -- Perceived Likelihood of College Success

   -- Likelihood of a Change in Major or Career

MEASURES OF COLLEGE EXPERIENCES

1. Academic Integration as reflected in the measures developed earlier: Classroom experiences, Faculty Contact, Faculty Relations. However, the Classroom Experiences and Faculty Relations Scales where strengthened as follows:
   Classroom: 5 new items where added and the response scale was lengthened from 4 points to 5. The internal consistency reliability (Alpha) improved from .60 to .82
   Faculty Relations: 1 item was added and the Alpha reliability remained about the same moving from .83 to .84

2. Faculty Concern and Effectiveness as rated by students on an A B C D F Scale. Respondents gave separate grades to the Faculty on their respect for students as people, their interest in student intellectual development, their availability outside of class, their instruction and their academic advising.

3. Academic Conscientiousness: This is a new scale of academic integration developed for this study. The items reflect the extent to which the student keeps up with course assignments, exercises good study habits, and gives a higher priority to academic than to social obligations. As shown in the results below, this scale is strongly associated with several of the outcomes measures and the items in the scale are shown in Table 1.

4. Social Integration as reflected in the measures developed earlier: Peer Relations, Social Activities, Extra-Curricular Activities. However, the Peer Relations Scale was strenthened by the addition of 2 items and the reliability (Alpha) increased from .84 to .88. Also, a slightly more elaborate set of extra-curricular activities was inserted.

5. Hours of Employment on and off the campus

TABLE 1

NEW MEASURE OF ACADEMIC CONSCIENTIOUSNESS

| | Item/Total Correlation | Alpha if Item Deleted |
|---|---|---|
| **Academic Conscientiousness (Alpha = .87)** | | |
| *1. I am lazy about keeping up with course assignments | .73 | .85 |
| 2. In general I exercise good study habits | .71 | .85 |
| *3. I tend to study only when I need to | .67 | .85 |
| *4. During most of the semester, I do very little studying on weekends | .66 | .85 |
| 5. I generally keep up with my reading assignments for class | .61 | .86 |
| *6. Most of the time at Albany, I give a higher priority to having fun than to studying | .61 | .86 |
| 7. Generally I put a good deal of effort into being well prepared for examinations | .52 | .86 |
| 8. On weekends I do more studying than partying | .57 | .86 |
| 9. I rarely need to cram for exams at the last minute | .45 | .87 |
| 10. My primary goal at Albany has been to take full advantage of the academic opportunities | .43 | .87 |

* Reverse scored for negative wording

TABLE 2

GROWTH SCALE MEANS, STANDARD DEVIATIONS & CORRELATION

| | M | SD |
|---|---|---|
| Personal/Social Responsibility | 6.32 | 1.37 |
| Independent Learning | 6.68 | 1.49 |
| Disciplinary Understanding | 6.36 | 1.25 |
| Liberal Arts | 5.95 | 1.40 |
| Math and Science | 5.56 | 1.20 |
| Possessing Clear Goals | 6.23 | 1.49 |

Note: Freshman to Senior Year Growth is self reported on a scale where 1 = no growth, 9 = extraordinary growth.

CORRELATIONS AMONG THE NEW GROWTH SCALES

| | Independent Learning | Disciplinary Understanding | Lib. Arts | Math & Science | Clear Goals |
|---|---|---|---|---|---|
| Personal/Social Responsibility | .70 | .50 | .68 | .47 | .50 |
| Independent Learning | | .45 | .55 | .48 | .58 |
| Disciplinary Understanding | | | .64 | .55 | .54 |
| Liberal Arts | | | | .40 | .47 |
| Math and Science | | | | | .55 |

EDUCATIONAL OUTCOMES MEASURES

1. Final Grade Point Average
2. Persistence and Graduation
3. Highest Degree Expected
4. "If you had it to do all over again, would you still attend Albany?"
5. **Growth in Personal and Social Responsibility**
6. **Independent Learning Scale**
7. **Disciplinary and Interdisciplinary Understanding**
8. **Liberal Arts Growth Scale**
9. **Math and Science Growth Scale**
10. **Possessing Clear Goals**

Factors one through four; Final Grade Point Average, Pesistence and Graduation, Highest Degree Expected and "If you had it to do all over again, would you still attend Albany?" are traditional measures previously used at Albany and many other campuses. Factors five through ten reflect our new growth scales based on self-reported responses to the 1990 Senior Survey. Factor analysis of student responses on a nine point scale yielded these growth scales shown in items five through ten: Growth in Personal and Social Responsibility, Independent Learning, Disciplinary Understanding, Liberal Arts, Math and Science, and Possessing Clear Goals.

RESULTS

Table 2 depicts the means and standard deviations of the New Growth Scales which were identified by the factor analysis. As displayed, the means range from 6.68 to 5.56 on a nine point scale, whereby 1 represents no growth and 9 represents extraordinary growth. Also shown in Table 2 are the results of correlations among the new growth scales. The findings reflect moderate correlations among all scales, with the highest correlation (.70), and therefore greatest overlap, occurring between the scales of personal/social responsibility and independent learning.

TABLE 3

RELIABILITY ANALYSIS FOR GROWTH IN PERSONAL/SOCIAL RESPONSIBILITY

| | Item/Total Correlation | Alpha if Item Deleted |
|---|---|---|
| **Personal/Social Responsibility (Alpha = .90)** | | |
| 1. Adapting to different social situations | .72 | .88 |
| 2. Relating well to people of different races | .64 | .89 |
| 3. Developing interpersonal and social skills | .64 | .89 |
| 4. Functioning effectively as a member of a team | .61 | .89 |
| 5. Understanding cultural differences | .61 | .89 |
| 6. Coping with conflict | .65 | .89 |
| 7. Developing an openness to new ideas | .60 | .90 |
| 8. Preparing for active participation in a democratic society | .63 | .89 |
| 9. Coping with moral and ethical issues | .63 | .89 |
| 10. Preparing for life in a changing world | .64 | .89 |
| 11. Developing a better understanding of myself (interests, talents, values, limitations) | .57 | .90 |

TABLE 4

Reliability Analysis for New Scale of Growth in Goal Clarity

| | Item/Total Correlation | Alpha if Item Deleted |
|---|---|---|
| **Possessing Clear Goals (Alpha = .81)** | | |
| 1. Possessing clear goals | .65 | .77 |
| 2. Developing a clear idea of my career goals and plans | .66 | .77 |
| 3. Gaining knowledge and skills applicable to a career | .55 | .79 |
| 4. Preparing for continued personal and intellectual growth after college | .55 | .80 |
| 5. Building a record of academic achievement that will enhance my future | .55 | .79 |
| 6. Preparing for Graduate or Professional School Study | .53 | .79 |

TABLE 5

RELIABILITY ANALYSIS FOR NEW SCALES OF STUDENT INTELLECTUAL GROWTH

| | Item/Total Correlation | Alpha if Item Deleted |
|---|---|---|
| **Independent Learning (Alpha = .82)** | | |
| 1. Exercising self-discipline | .67 | .77 |
| 2. Exercising personal responsibility | .67 | .77 |
| 3. Functioning independently (self-reliance) | .61 | .79 |
| 4. Developing the ability to learn on my own | .60 | .79 |
| 5. Learning how to learn | .51 | .81 |
| **Disciplinary Study (Alpha = .80)** | | |
| 1. Understanding a particular discipline's various schools of thought | .66 | .73 |
| 2. Understanding the inter-relatedness of different fields of study | .63 | .74 |
| 3. Recognizing general principles in specific events/conditions | .63 | .74 |
| 4. Understanding a particular discipline's research methods | .56 | .77 |
| 5. Gaining factual knowledge | .42 | .80 |
| **Math & Science Growth Scale (Alpha = .79)** | | |
| 1. Understanding mathematical concepts | .59 | .75 |
| 2. Developing problem solving skills | .63 | .74 |
| 3. Understanding scientific findings | .60 | .75 |
| 4. Thinking analytically & logically | .56 | .75 |
| 5. Evaluating ideas and methods critically | .44 | .78 |
| 6. Learning fundamental principles, generalizations, or theories | .48 | .77 |
| 7. Confident in my ability to earn high grades in most science and math courses | .35 | .79 |
| **Liberal Arts Growth Scale (Alpha .81)** | | |
| 1. Appreciating artistic and creative expresssion | .60 | .77 |
| 2. Developing intellectual curiosity | .59 | .77 |
| 3. Placing current problems in historical perspective | .58 | .77 |
| 4. Knowing literature of recognized merit | .58 | .78 |
| 5. Developing the ability to formulate creative and original ideas | .57 | .78 |
| 6. Synthesizing a body of information | .50 | .79 |

Table Three shows the reliability analysis for the scale of Personal/Social Responsibility(Alpha = .90). This scale of eleven items reflected student growth in adapting to different social situations, relating well to people of different races, developing interpersonal and social skills, functioning effectively as a member of a team, understanding cultural differences, coping with conflict, developing an openness to new ideas, preparing for active participation in a democratic society, coping with moral and ethical issues, preparing for life in a changing world and developing self understanding.

Table Four shows the reliability analysis for the new scale of growth in possessing goal clarity. On this scale, students recorded the extent to which they had clear future plans for graduate school and other long range career objectives.

Table Five shows the reliability analysis for the Intellectual Growth Scales: The scale of Independent Learning yielded an Alpha of (.82) with items such as exercising self-discipline and personal responsibility, functioning independently, and learning how to learn. Disciplinary and interdisciplinary understanding (.80) relected growth in disciplinary research methods, understanding the inter-relatedness of different fields, recognizing general prinicples, and gaining factual knowledge. The Math and Science Growth Scale (Alpha =.79) included items reflecting growth in mathematical concepts, problem solving skills, understanding scientific findings, thinking analytically and logically, evaluating ideas and methods critically, among others. The last scale, Liberal Arts, (Alpha =.81) concerned itself with art, creativity, literature, original ideas and synthesizing information.

Tables 6 and 7 display the results of the regression analysis. The tables show the beta weights and R-square values for each of the nine outcomes measures. There are two ways to read the tables - vertically and horizontally. Looking vertically at the results for each regression, the beta weights show the variables which are most strongly associated with each dependent variable. In the regression for Cum GPA, for example, the three strongest associations are with high school average, total SAT Score, and academic conscientiousness. The pre-college measures account for 23% of the variance, while the measures of academic and social integration explain 14% of the variance. The total R-square of .37, however, is quite high. Note that the variable of student employment is a significant negative influence.

TABLE 6

**Regression Beta Weights for Educational Outcomes of Albany Seniors**

| | Cum. GPA | | Highest Degree | | Clear Goals | | Still Attend Albany | |
|---|---|---|---|---|---|---|---|---|
| | Beta | $R^2$ | Beta | $R^2$ | Beta | $R^2$ | Beta | $R^2$ |
| **Pre-College Variables:** | | .23 | | .12 | | .02 | | .01 |
| Total SAT Score | .22 | | | | | | | |
| High School Avg. | .37 | | | | | | | |
| Diversity | .12 | | .12 | | | | | |
| Social Concern | | | | | -.10 | | | |
| Ambitiousness | | | | | | | | |
| Grad. School Likelihood | | | .19 | | | | | |
| Change Likelihood | .15 | | | | | | | |
| Science Oriented | -.13 | | | | | | | |
| Female Gender | -.12 | | | | | | | |
| **College Variables:** | | .14 | | .08 | | .28 | | .33 |
| ACADEMIC INTEGRATION | | | | | | | | |
| Classroom Exper. | .10 | | | | .25 | | .38 | |
| Conscientiousness | .24 | | .14 | | .15 | | | |
| Faculty Concern | .11 | | | | .11 | | .18 | |
| Faculty Relations | | | .12 | | | | | |
| Fac. Contact-Acad. | | | .10 | | | | | |
| Fac. Contact-Social | | | | | | | | |
| SOCIAL INTEGRATION | | | | | | | | |
| Peer Relations | | | | | .16 | | .09 | |
| Social Activities | | | | | | | .16 | |
| X-Activities | | | | | | | | |
| Employment | -.17 | | | | | | | |
| TOTAL $R^2$: | | .37 | | .20 | | .30 | | .34 |

Table shows only Beta Weights significant at $P < .10$.

TABLE 7

**Regression Beta Weights for Educational Outcomes of Albany Seniors**

| | Independent Learning | | Liberal Arts | | Math & Science | | Disciplinary Understanding | | Personal & Social Growth | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Beta | $R^2$ | Beta | $R^2$ | Beta | $R^2$ | Beta | $R^2$ | Beta | $R^2$ |
| **Pre-College Variables:** | | .11 | | .11 | | .07 | | .07 | | .17 |
| Total SAT Score | -.13 | | -.11 | | | | | | -.13 | |
| High School Avg. | | | | | .16 | | | | | |
| Diversity | .10 | | .19 | | | | .16 | | .18 | |
| Social Concern | | | | | | | | | .10 | |
| Ambitiousness | | | | | | | | | | |
| Grad. School Likelihood | -.11 | | | | | | | | | |
| Change Likelihood | .11 | | | | | | | | | |
| Science Oriented | | | | | .16 | | | | | |
| Female Gender | .17 | | | | | | | | .17 | |
| **College Variables:** | | .14 | | .17 | | .17 | | .20 | | .27 |
| ACADEMIC INTEGRATION | | | | | | | | | | |
| Classroom Exper. | .16 | | .30 | | .21 | | .34 | | .14 | |
| Conscientiousness | | | | | .14 | | | | -.10 | |
| Faculty Concern | | | | | | | | | | |
| Faculty Relations | | | | | | | | | | |
| Fac. Contact-Acad. | | | | | .14 | | .11 | | | |
| Fac. Contact-Social | | | | | | | -.12 | | | |
| SOCIAL INTEGRATION | | | | | | | | | | |
| Peer Relations | .18 | | .10 | | .20 | | .11 | | .31 | |
| Social Activities | | | .10 | | | | | | .20 | |
| X-Activities | | | | | | | | | .09 | |
| Employment | | | | | | | | | | |
| TOTAL $R^2$: | | .25 | | .28 | | .24 | | .27 | | .44 |

Table shows only Beta Weights significant at $P < .10$.

The highest degree expected by the seniors is the only other outcomes measure where the precollege variables explain more of the variance than the college variables. As expected, graduate school plans upon entrance is the single most influential variable in predicting senior year plans.

In each of the other seven outcomes measures, the college experiences account for a greater degree of the explanatory power than the pre-college variables. This is especially true in the case of goal clarity and willingness to attend Albany "all over again," where the pre-college variables are not significant.

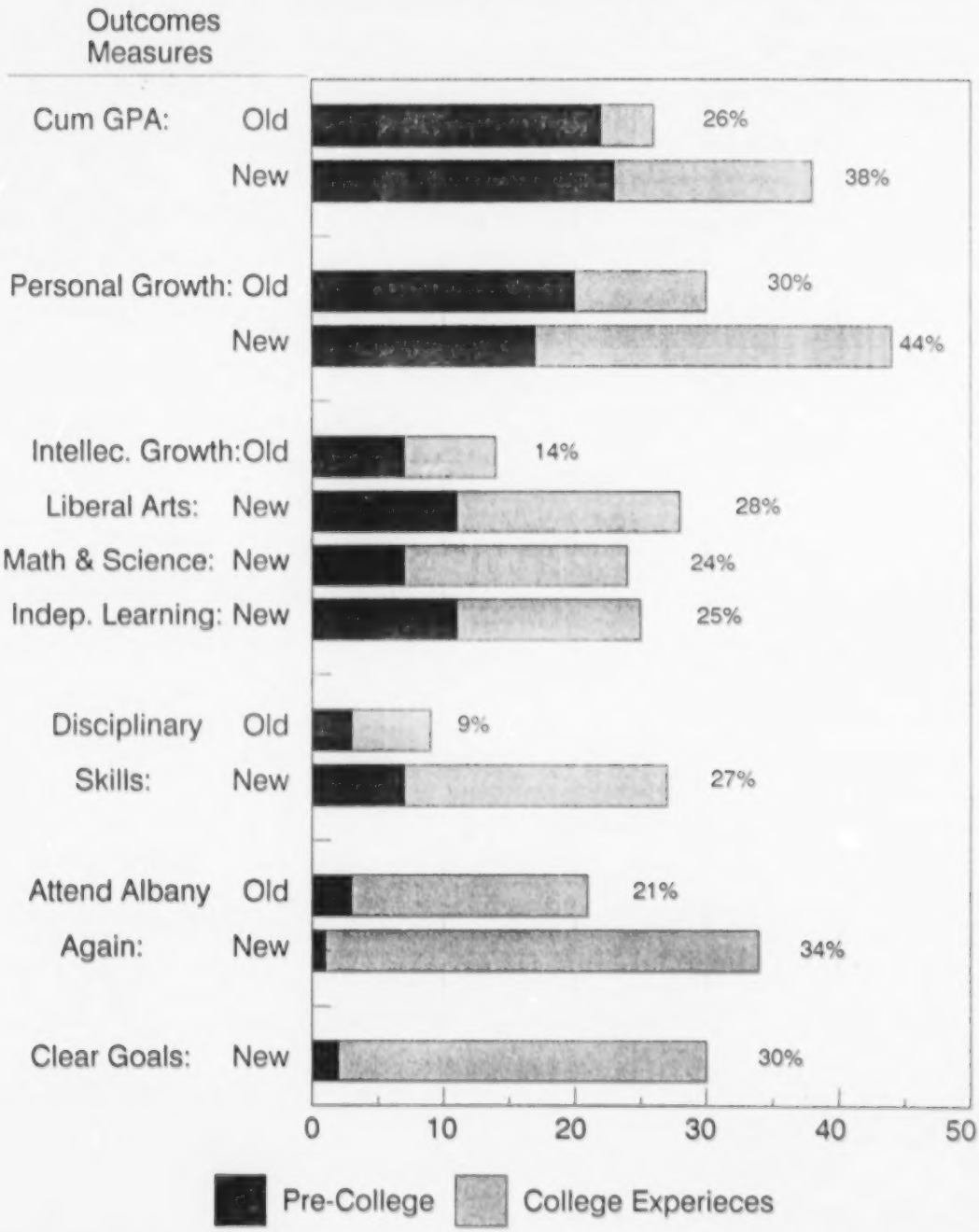
Table 7 shows the regression results for the scales of intellectual and personal growth. In each case the R-square values are rather significant and the measures of academic and social integration are more influencial than the characteristics and attitudes students held when they entered. These findings are consistent with the Tinto Model and confirm that the college experience is a more important influence on student growth than the individual differences they bring with them.

These results also are consistent with Terenzini's previous studies at Albany which showed that many pre-college traits, such as age, parent's education, and in several cases even gender, proved to be not significantly associated with the criterion variable. (Females in our sample, however, did report more independent learning and personal/social growth than males.)

Another important finding is that the measures of academic integration, especially the classroom experience, proved to be more influential in predicting the intellectual growth outcomes, whereas the social integration measures, especially peer relations, are more strongly associated with growth in personal and social responsibility. This suggests that the growth scales are adequately independent of each other despite their relatively high intercorrelations shown in Table 2 above.

EDUCATIONAL OUTCOMES AT ALBANY

**The Percent of Variance Explained by the Old and the New Measures of Pre-College Characteristics, and College Experiences**



Viewing Tables 6 and 7 horizontally, other patterns in the data emerge. Among the pre-college predictors of senior outcomes, freshman interest in academic diversity is influential for 6 of the 9 dependent variables. Among the college variables, Classroom Experiences, Peer Relations, and the new scale of Academic Conscientiousness made significant contributions to the results of many regressions. Apparently, the vitality of the instructional experience, combined with the student's own academic effort and peer group support, provide the ingrediants which produce the greatest student learning and growth.

One of our goals in this study was clearly accomplished. We set out to develop more reliable measures of the concepts in our outcomes model, and the results are perhaps most visibile in the improved amounts of explained variance shown on the bar graph. The bars compare the old measures on previous populations of students at Albany with these results on the 1990 seniors. In every case, the new measures of academic and social integration exhibit greater explanatory power than the old measures. As noted above, the amounts of explained variance in Cum GPA, personal/social growth, and willingness to attend Albany "all over again" are especially impressive.

After reviewing the data, we believe that most of the improvement is due to the more reliable and newly developed measures of college experiences. We cannot be absolutely sure, of course, that the results are attributable solely to the improved measures, but we know of nothing special about the 1990 seniors at Albany which leads us to believe that they are different from our earlier cohorts. However, further study on other populations to confirm these findings would be wise.

Given the contents of these scales, our findings strongly suggest that educational outcomes are the most heavily influenced by the vitality of the classroom experience delivered by the faculty, by the strength of student peer linkages and friendships, and by the student's own effort and intellectual investment in learning.

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